ARCHITECTURAL

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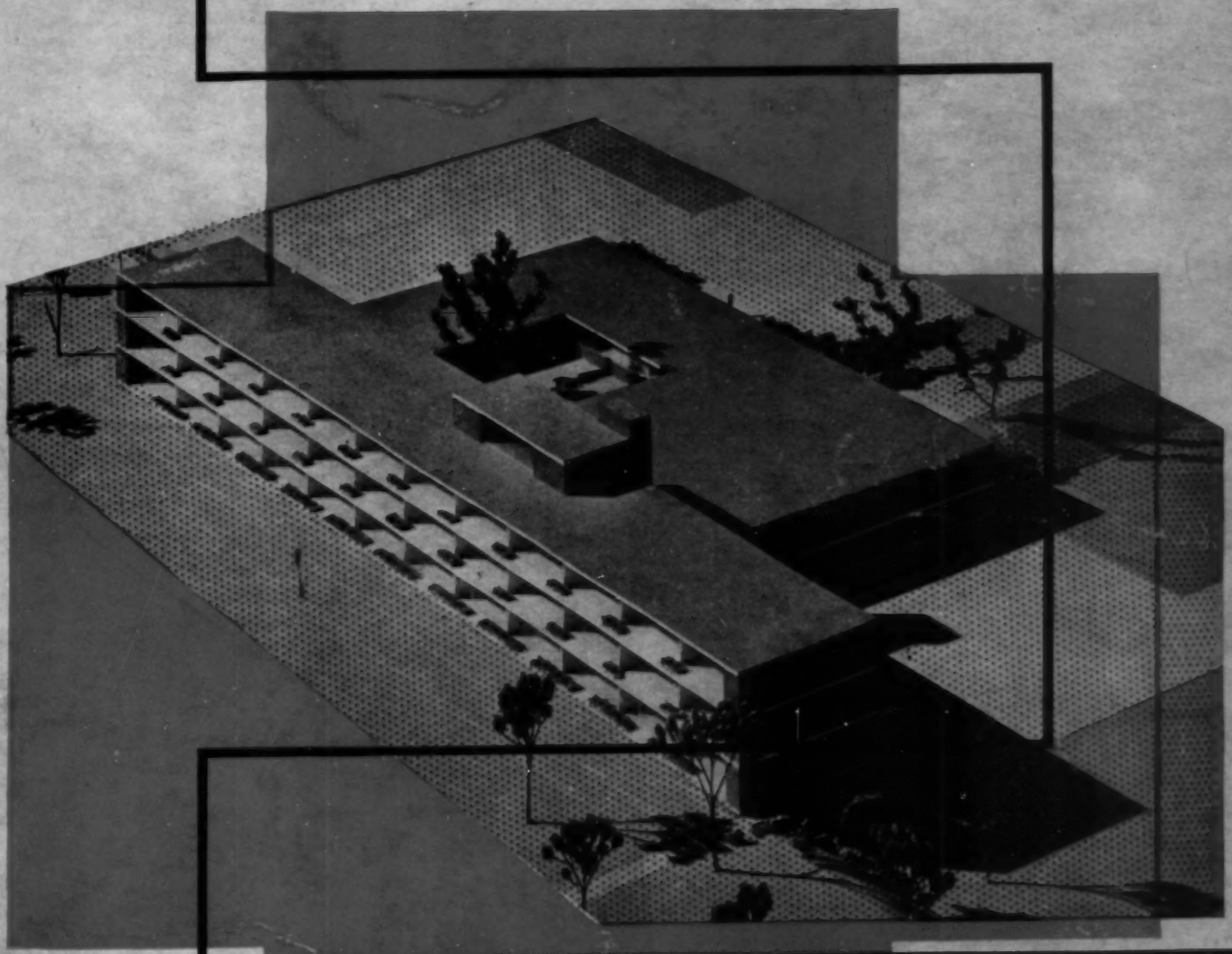
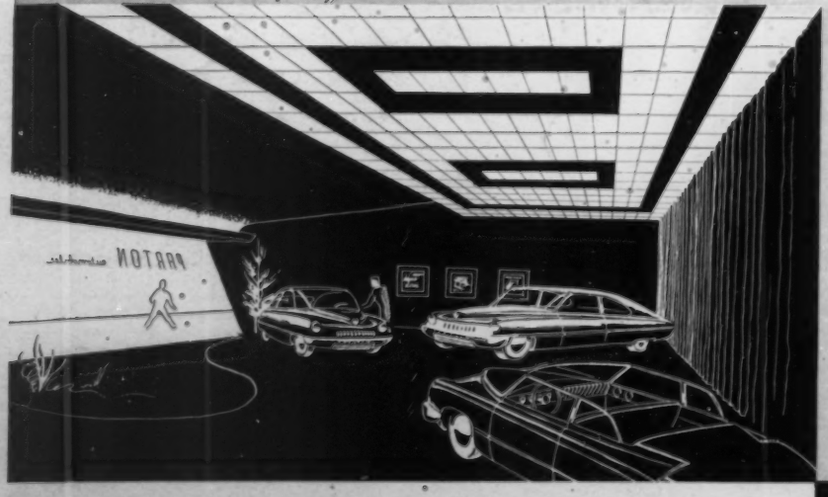


AUGUST 1946

HOSPITALS

Versatility in Lighting

CEILINGS UNLIMITED



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ARCHITECTURAL RECORD (Vol. 100, No. 2, August, 1946) is published monthly by F. W. Dodge Corp., 10 Ferry Street, Concord, N. H., with editorial and executive offices at 119 W. 40th St., New York 18, N. Y. $3 per year; Foreign, $5.

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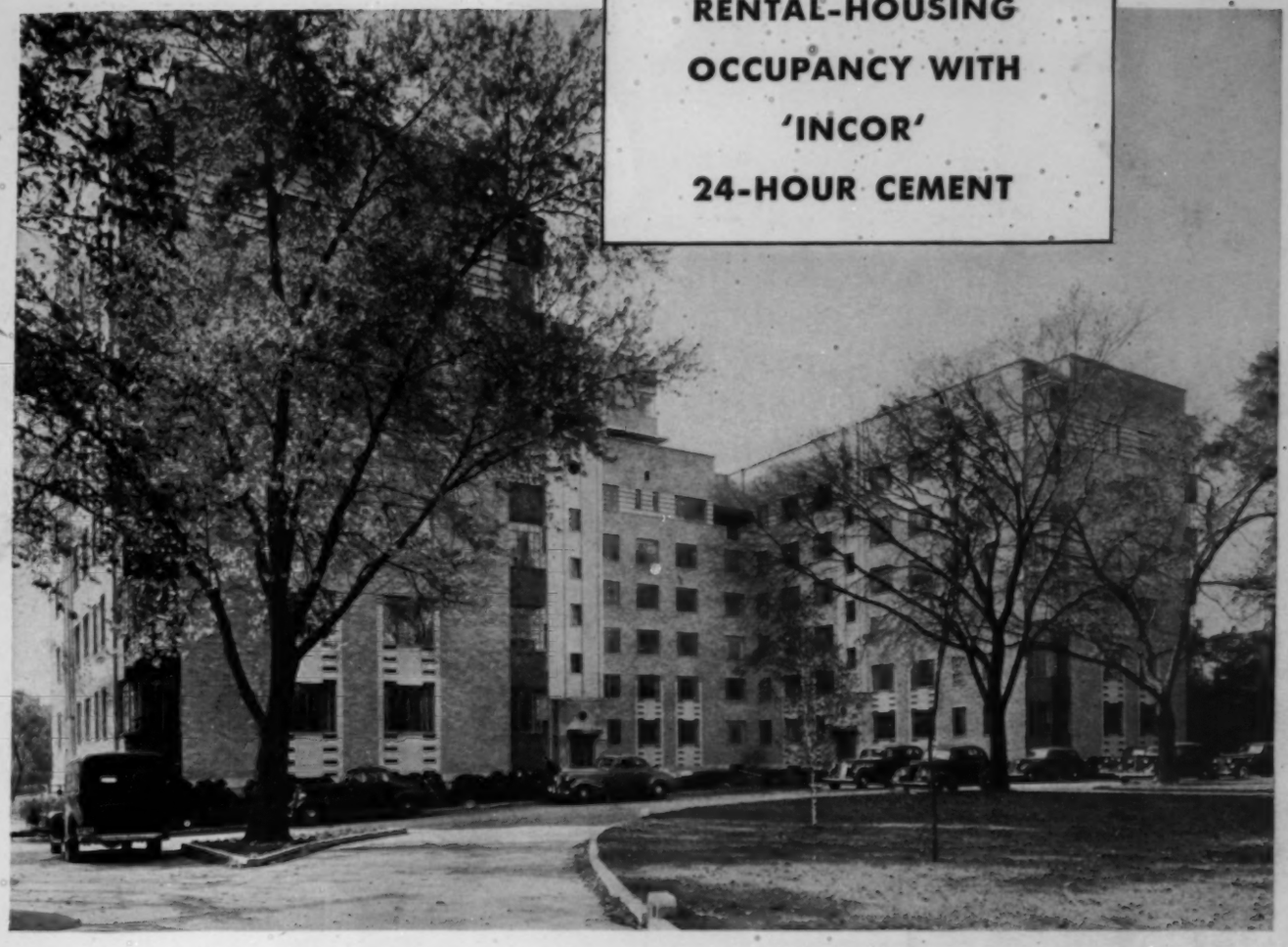

Rental-housing is needed in a hurry. Speed construction with 'Incor' 24-Hour Cement. 'Incor' concrete is service strong, ready to strip, in a fraction of the usual time . . . Result, faster erection speed at substantially reduced cost. On Royal York Apartments, Columbus, Ohio, 'Incor' saved one complete form-set and two sets of shoring. Erection time was advanced by 1½ months, worth $10,500 in rentals to the owner. And 'Incor' actually saved the contractor $900 net, when this job was built, in 1937. At TODAY'S peak lumber and labor costs, this 'Incor' saving would amount to at least $2070! Specify 'Incor',* America's FIRST high early strength Portland Cement . . . save 40–60% on form material and make-up, cut time and overhead, get earlier completion at less cost. Write for "Cutting Concrete Costs" . . . address Lone Star Cement Corporation, 342 Madison Avenue, New York City 17, N. Y.

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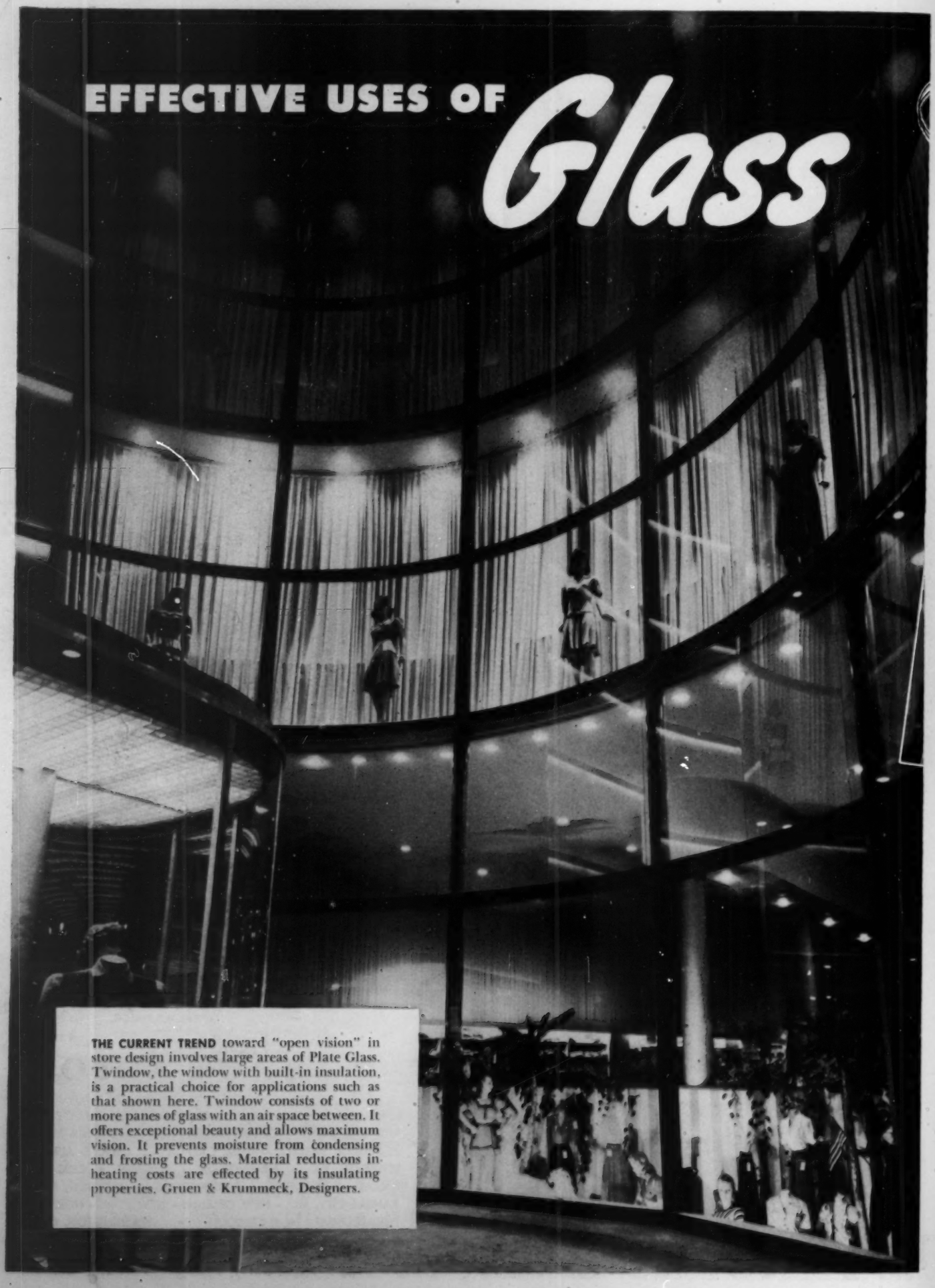
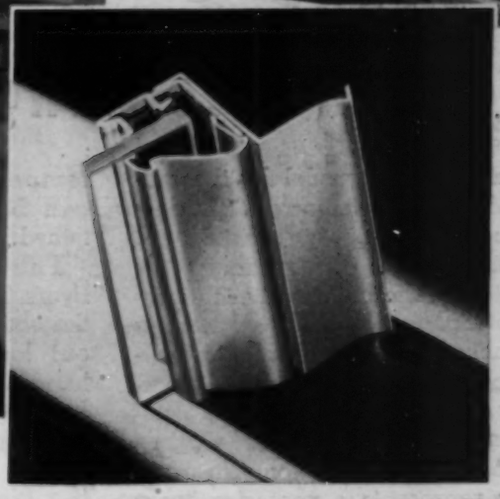


THE CURRENT TREND toward "open vision" in store design involves large areas of Plate Glass. Twindow, the window with built-in insulation, is a practical choice for applications such as that shown here. Twindow consists of two or more panes of glass with an air space between. It offers exceptional beauty and allows maximum vision. It prevents moisture from condensing and frosting the glass. Material reductions in heating costs are effected by its insulating properties. Gruen & Krummeck, Designers.

IN COMMERCIAL BUILDINGS

HERCULITE TEMPERED PLATE GLASS has all the beauty and clarity of regular Plate Glass, but is four times as strong. It is therefore a very useful material to the architect for applications of many types. It has become particularly popular for modern, handsome store doors like these. Architects: J. W. Smith & Associates.



WHERE THE ARCHITECT wishes to achieve an atmosphere of sparkling gayety and beauty, or create an impression of spaciousness, or merely to obtain interesting reflections of merchandise offered for sale, Pittsburgh Plate Glass Mirrors are the perfect medium. Especially now that they are available in appealing colors, and can be protected by Copper Backing against deterioration caused by moisture and variations in temperature.

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Garfield, Harris, Robinson & Schafer, Architects

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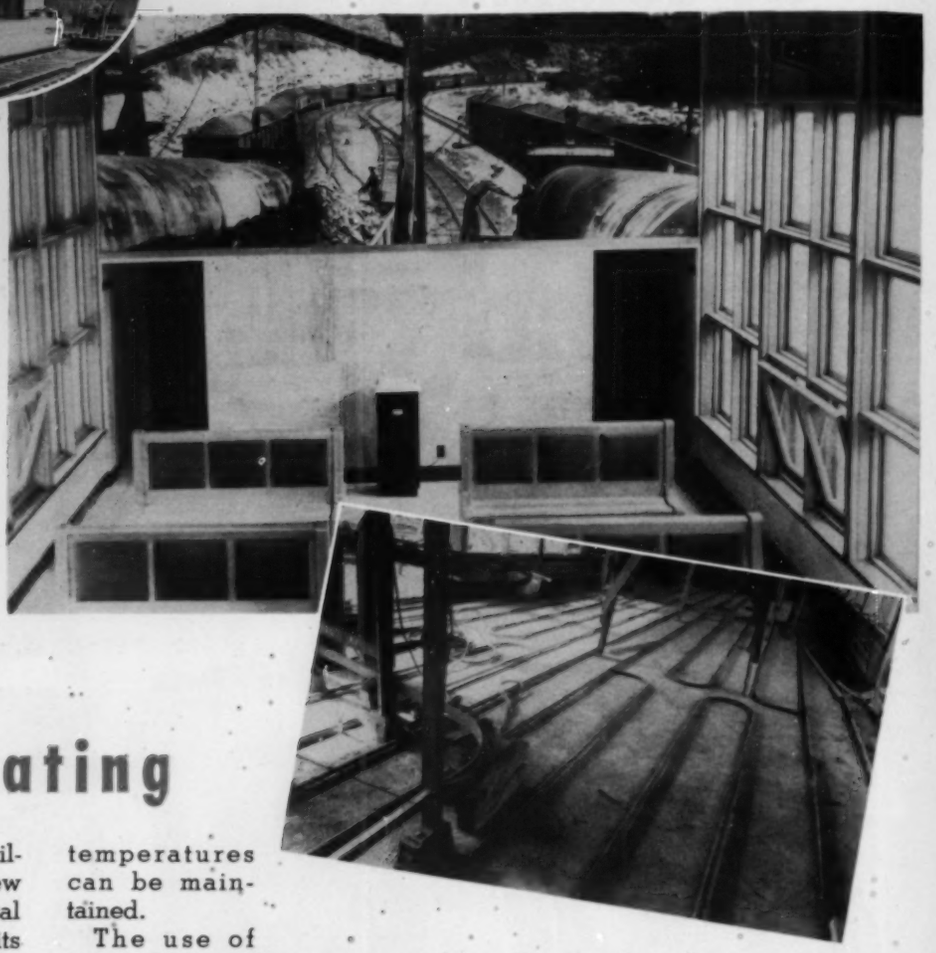

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Designed as a model for the railroad station of tomorrow, this new structure is modern in architectural treatment and in a number of its features. The building has fluorescent lighting, upholstered waiting benches, "picture" windows, well-appointed lounges, terrazzo flooring inlaid with the "Chessie" emblem of the C&O, and a large photo-mural decoration. The heating represents a very significant advance, for it is the first Byers Radiant Heating system to be installed in a railroad station.

Byers Wrought Iron pipe, formed into coils on 18-inch centers, are embedded in 1¼-inches of sand on a 4-inch structural concrete floor slab. The sand is covered with concrete, which is topped by sectional terrazzo flooring. In the waiting room, wrought iron coils, spaced on 12-inch centers, are installed behind the ceiling. A stoker-fired coal burning boiler provides hot water, which is circulated by thermostat-controlled pumps. Waiting room and baggage room are separately zoned, so that desired temperatures can be maintained.

The use of Byers Radiant Heating permitted the economy of construction without basement, eliminating the handicap of chilly, damp floors. It has another big advantage also, in that comfort does not depend on having the atmosphere warm, so that the effects of excess infiltration are minimized. With no exposed heating units, all of the floor space is available for use.

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Selecting FLUSH VALVES FOR HOSPITALS . . . .

Official U.S. Navy Photograph

• A recent survey among architects, widely experienced in hospital design, discloses a number of interesting trends in flush valve applications for hospitals. For example, there seems to be a trend toward the use of foot-operated combinations; there is a marked preference for *silent-action* flush valves. These trends and others are discussed in the booklet offered below.

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• Fitzsimmons General Hospital, Denver, Colorado. Watrous Flush Valve equipped. Architect: Construction Division of Quartermaster General's Office. Supervising Architect: L. M. Leisenring. Plumbing Contractor: Thos. F. Shea Co., St. Paul, Minn.

• Cook County School of Nursing, Chicago, Ill. Watrous Flush Valves throughout. County Architect: Eric E. Hall. Consulting Engineer: Willis J. Dean. Plumbing Contractor: E. J. Young & Co.

ARCHITECTS' VIEWS ON FLUSH VALVE APPLICATIONS

A survey of interesting trends in the selection of flush valves for postwar buildings is given in Bulletin No. 477—"How Architects Look at Flush Valve Applications." Write for your copy.

THE IMPERIAL BRASS MFG. CO., 1240 W. Harrison St., Chicago 7, Illinois

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THE RECORD REPORTS

Housing Program is Still Beset by Many Problems Premium Payments Set • NHA Applies Standards to Priority Housing • Apprentice Training Pushed

Reconversion clouds continue to hang over the housing program one year after the end of World War II. The OPA thunderbolt of last month left debris everywhere, but particularly in building. Nobody yet quite knows where he is — price-wise.

A dazed Congress moved cumbersomely to right the price havoc after President Truman killed the "unsatisfactory" OPA Bill by veto. Meanwhile, the nation snarled itself in confusion and uncertainty. Housing Expediter Wilson Wyatt, worried about potential rises in building materials prices, feared for his whole housing structure. CPA and NHA powers alone, he felt, could not meet the gigantic task and keep home prices down.

The Housing Chief sought to speed construction where he could, through priorities, premium payments, other powers. He directed materials into construction of temporary re-use dwellings for veterans and, in doing so, ran into charges of bad faith and favoring public housing projects at the expense of private builders. The National Association of Home Builders presented an open protest against his action.

Even as these problems piled up, the NHA came out with its first monthly report on the Veterans' Emergency Housing Program — a 24-page printed document, magazine-size, entitled "Housing" — which told of home building in the first five months of 1946 coming close to the peak year of 1925. The report admits, however, that prefabricated house production has been slow because of tooling requirements and that this activity will not be in full swing until next year.

An early problem in the housing program was the granting of many non-housing jobs. NHA and CPA had to crack down and pare projects to the bone. Save in the case of "exceedingly severe hardship," grants subsequently were held to health and safety, critical materials and food production, residential facilities, veterans' educational needs, and maintenance and repairs. Authorizations were cut $22 million a day, reaching an average reduction of 74 per cent, and over 2,000 unauthorized jobs were stopped in one month alone.

Premium Payments Set

Premium payments under the veterans' housing law came into prompt operation. Manufacturers of structural clay products were first in line, suppliers of peeler logs for softwood plywood second, and gypsum board and lath third.

The clay products plan, to run until next June 1, seeks to offset unusual costs in reopening plants or expanding production. Payments of $5 will be made for each 1,000 "standard brick equivalents" in excess of established quotas.

In the peeler log plan, plywood companies may pay log suppliers a premium of $7.50 per 1,000 feet logscale until next March 31 and will be reimbursed if they meet plywood production goals set up under the regulation.

The gypsum board and lath plan, cancelable on 30 days' notice, allows incentive payments of $40 a ton for above-quota production of gypsum liner (which has been the bottleneck for board and lath).

Expediter Wyatt makes the point clear that NHA is moving first "in the materials fields where the shortages are most critical."

Other Controls Exercised

Other federal steps to boost building materials production include an emergency distribution system for steel during the July-September quarter with preference by steel mills and warehouses

(*Continued on page 10*)

". . . heavily mortgaged houses they don't want."

Housing Expediter Wilson Wyatt, armed with $400,000,000 for subsidy payments, is out to put veterans in heavily mortgaged houses they don't want.

Survey of all vets discharged in seven months following V-J Day, made for New York legislature, showed 71.8 per cent wanted to rent shelter. Only 20.3 per cent hoped to buy. The rest didn't care.

Vast majority of veterans are in their 20's. They want to look around before they settle, don't want to be frozen to 20 or 30 year mortgage schedules.

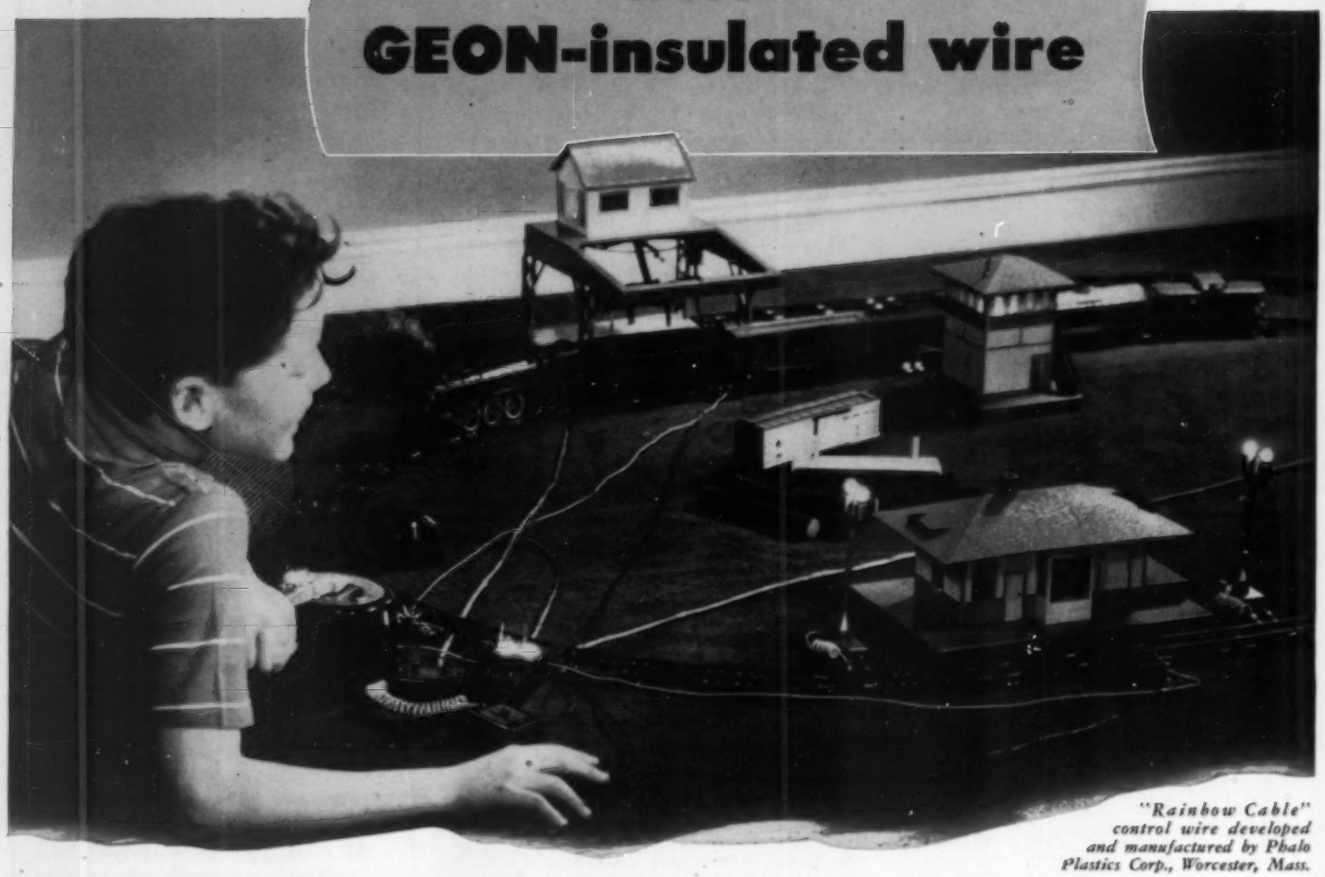
United States Employment Service finds that 75 per cent of employed veterans are making $40 a week, or less. At $40, leaving scant allowance for other inflated living costs, veteran could handle a maximum mortgage of $4,000.

Construction men fear veterans housed under Wyatt program may become bitter over cheap housing, long-payment plans. This would open the way, they point out, for Congressional drive to "excuse" payment of mortgage balances. — *Nation's Business*, June, 1946, p. 17.

"What do you expect for $6,000 — articulation?"

— Drawn for the RECORD by Alan Dunn

He runs his road with GEON-insulated wire



"Rainbow Cable" control wire developed and manufactured by Phalo Plastics Corp., Worcester, Mass.

GEON's *advantages make it ideal insulating material for instrument, home, industrial and utilities wiring*

THE things that Bill used to do with his hands to keep his railroad running—coupling and uncoupling cars, loading and unloading, turning switches—are all done by electricity on the modern American Flyer that huffs and puffs and belches smoke just like its full-sized counterpart.

That calls for connecting wires that are easy to identify, that stand rough usage, that won't crack, get gummy or peel, that will keep fire hazards to a minimum. That's why the A. C. Gilbert Company selected wire with insulation made from GEON. It can be brilliantly colored in a wide range, it wears indefinitely, resists aging and ozone, and is self-extinguishing—won't support combustion.

These and other properties of insulation made from GEON have earned it an important place in every part of the electrical industry. The thinner coating of insulation made possible by GEON's electrical properties permit more conductors per conduit. Resistance to oil and grease, acids, alkalis, moisture, heat, cold, and most other normally destructive factors mean that insulation made from GEON can be used *everywhere.*

The next time you order wire—for manufacturing, home, or industrial wiring—be sure to specify wire insulated with GEON, now being made by leading wire and cable manufacturers. Or for information about special applications please write DepartmentA-8, B. F. Goodrich Chemical Co., Rose Building, Cleveland 15, Ohio. In Canada: Kitchener, Ontario.

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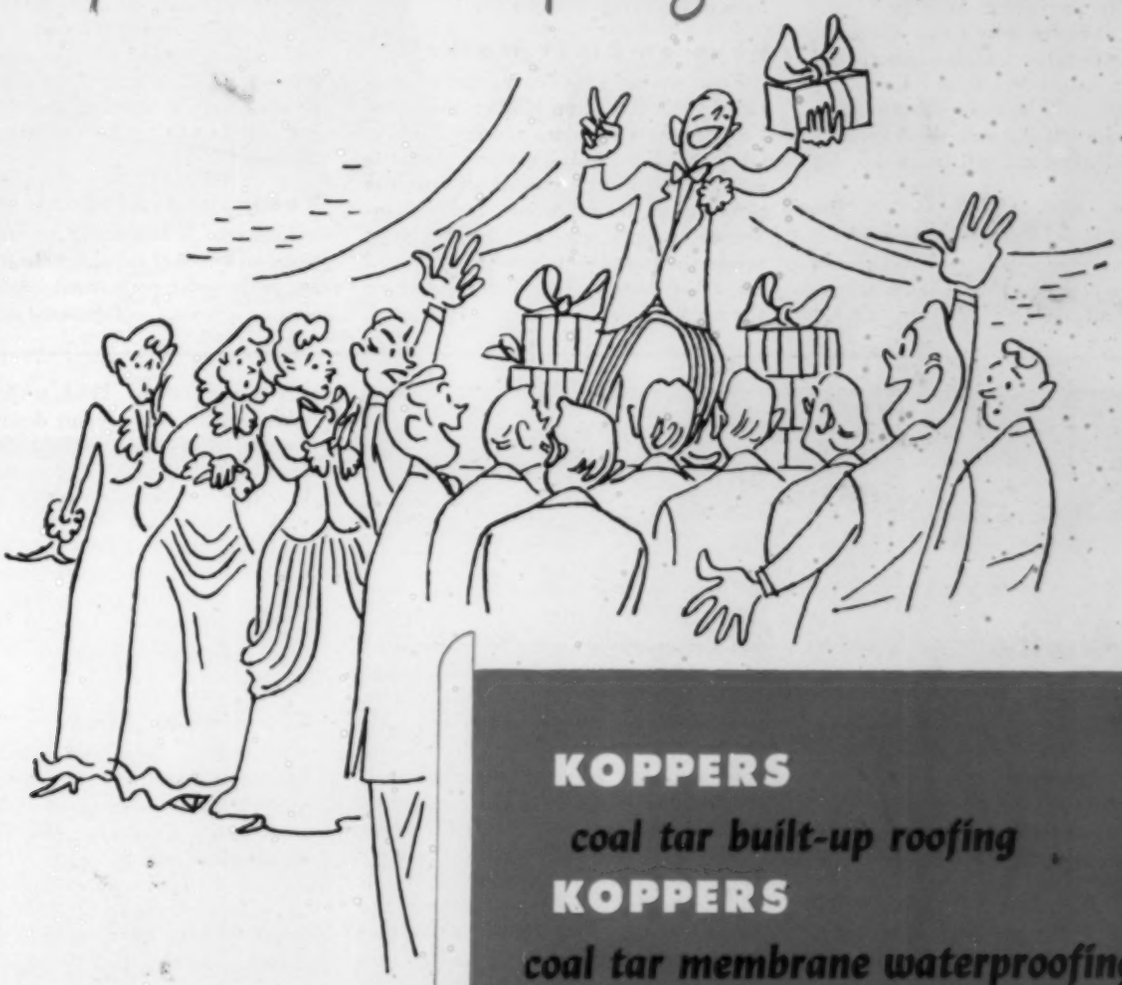
Why is a roof like a package at a "box-social"?



KOPPERS
coal tar built-up roofing
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a **KOPPERS** *Product*

THE RECORD REPORTS (*Continued from page 7*)

for certified housing orders.

CPA brought under government control the output of every sawmill in the country instead of just those producing above 8,000 softwood or 4,000 hardwood feet per day. The action, expected to boost housing lumber and flooring reserves by more than four billion feet, not only ups sawmill reserves but also cuts down the number of military rated orders to be filled.

The War Assets Administration arranged to make salvaged lumber and critical building materials available for housing construction. It planned to have 15 dismantling jobs under way August 1 with components ready for sale shortly thereafter. Another 15 are due to be under way by Labor Day and 20 more by October 1. Of the anticipated 1½ billion board feet thus released by WAA, much will be heavy timber used on ordnance plants and the like, but substantial amounts will be usable for housing.

Housing Standards Set

As the veterans program moves ahead, NHA actively applies minimum standards for all priority housing. Called "HH Minimum Property Requirements," the plan covers space, arrangement and construction features. Aside from site and neighborhood provisions, the requirements follow those set up by FHA under the National Housing Act.

NHA also is distributing a 12-page pamphlet through the Mayor's Emergency Committees warning against inflation dangers in housing prices and containing a check list as a guide in estimating cost in buying or building a home. Thirty items listed for checking touch on details of construction, wiring and heating equipment, location, availability of schools, shopping centers, transportation, and cover as well problems of financing and upkeep.

Move on Black Markets

Four major agencies recently combined their attack on lumber and other building material black markets. NHA, OPA, Justice and Treasury Departments pooled their powers of criminal prosecution, investigation, treble damage, injunctions, etc., and applied them across the board — to producers, truckers, distributors, consumers — where the need arose.

Besides supplying suspect lists to the other agencies, OPA announced the filing in late June of 40 suits in the Pacific region, involving 65,000,000 board feet of lumber and covering such charges as diversion of lumber, resawing without regrading, producing non-standard sizes at high rates, upgrading, charging for more lumber than received, making wholesale sales at retail prices, over-ceiling sales, etc., and cutting short lengths.

Apprenticeship Pushed

Faced with manpower shortages, Expediter Wyatt presses for more apprentices in skilled construction crafts, warns that the training program has not been enough to meet the need. Skilled workers will be needed in such fields as electrical, plumbing, painting, sheet metal, bricklaying and other trowel work, carpentry and cabinet making. NHA reported an increase of 22 per cent in apprentices at work in the building trades in May compared to April — mostly former G. I.'s.

Rent Subsidies at Issue

Congress is beginning to raise questions on low-rent subsidies for war housing projects for permanent construction,

(*Continued on page 14*)

New Chevrolet assembly plant has concrete and glass exterior walls, concrete louvers

BUILDING NOTES

Automobile Plant

At Van Nuys, Calif., construction has been started on a new Chevrolet assembly plant consisting of an office building, garage, assembly building, parts and car loading buildings, acetylene generating plant, etc. Architect is Donald B. Parkinson; Albert Kahn Associated Architects & Engineers Inc., consultant.

The assembly building has a structural steel frame with metal deck roof and concrete floor construction. Exterior walls are of exposed concrete and glass. The office building has a reinforced concrete structural frame and walls of exposed concrete and glass. The windows on the west side of the assembly and parts buildings and the windows of the office building are protected with vertical fixed louvers of lightweight concrete overlapping slabs. Office partitions are of metal and glass.

Practically all seismic loads are carried through bending stresses in the columns and vertical cross-bracing was not used except along the few permanent walls of the structure. Since these seismic loads occur in any direction, the column axes were turned north-south and east-west so that equal strength in bending was available for the two directions. The radical difference in seismic loading in the two stories produced column splices at the second floor with large changes of size in the columns at this point. Column bases were designed for seismic moments based upon a flexpoint at ⅓ of the clear first story height. No moments were designed into the column splices at the second floor.

Auto Showroom

A new showroom and repair building for John D. North, Ford dealer of Urbana, Ohio, has an entire front of plate glass.

The building, designed by Zeller and Hunter of Springfield, Ohio, is laid out so that the showroom has display space for four cars. Behind it are the general and private offices and the parts department. In the rear are two rooms partitioned off by brick walls for the paint and the body repair departments. Gasoline pumps are located away from the front of the building so that they do not detract from its appearance.

Side walls are built of concrete block and the roof over the repair area is arched, of wood girder construction. Large metal-sash factory-type windows provide a maximum amount of natural illumination. The building is radiant-heated.

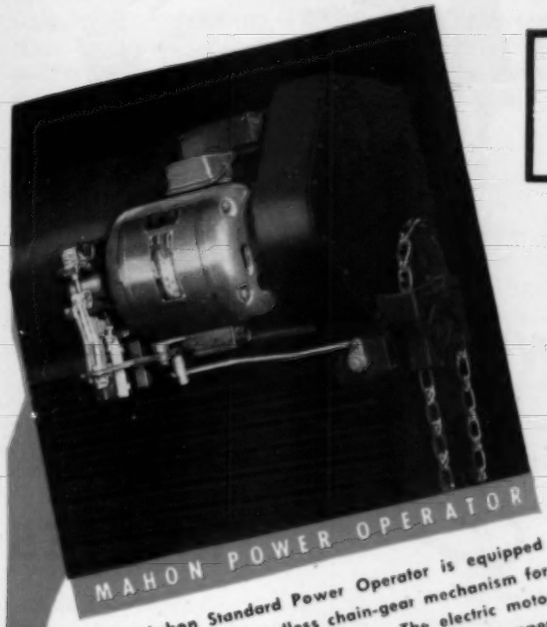
Aluminum Plant

Plans have been announced by the Aluminum Company of America for the construction of a large new plant near Davenport, Iowa, for the rolling of aluminum sheet and plate. The plant, estimated to cost over $30,000,000, will have the capacity to produce more than 10,000,000 lb. of sheet and plate per month. Construction is scheduled to begin as soon as the project has been approved by the CPA, and will require approximately 18 months.

(*Continued on page 13*)

Plate glass front for new Ford showroom

Rolling Steel DOORS



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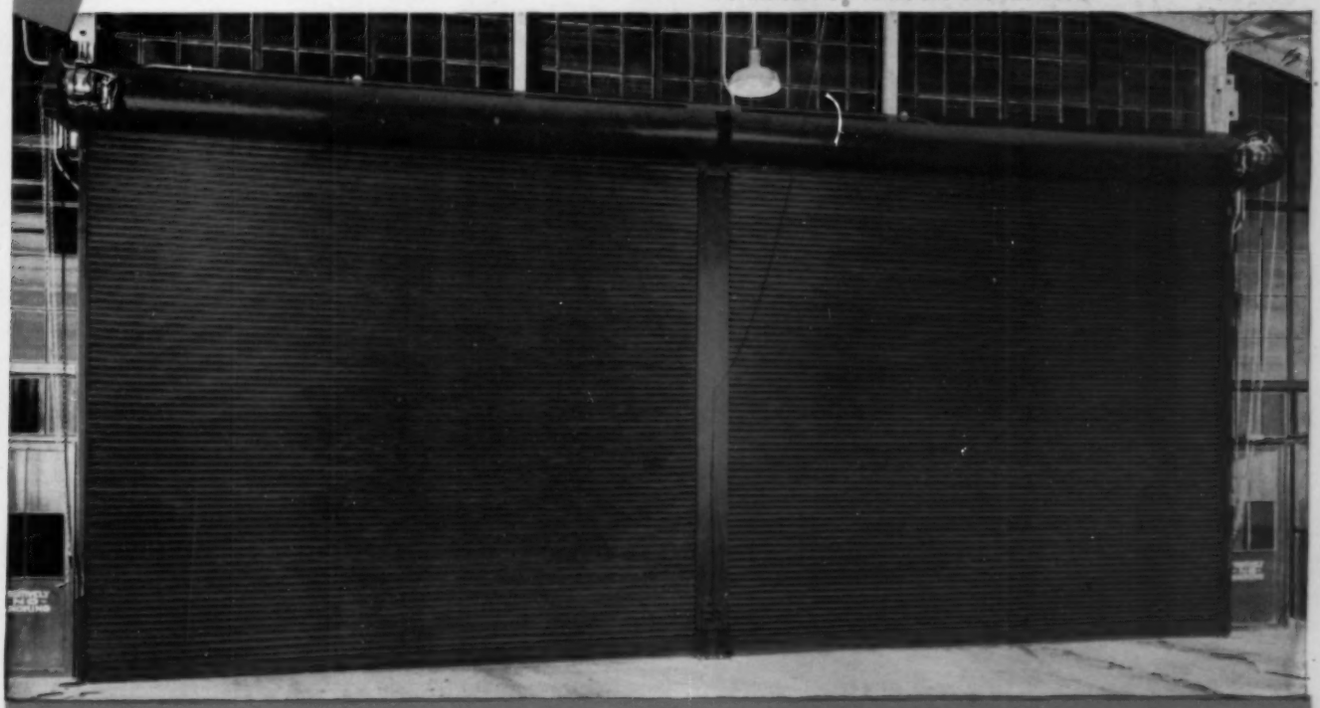


ROLLING STEEL DOORS, SHUTTERS AND GRILLES TO MEET EVERY REQUIREMENT

MAHON

Take the word of these magazine surveys*

WOMEN WANT *Electric* RANGES

There's no guesswork about it! Magazines are constantly testing their readers' preferences—and survey after survey shows that the swing is to ELECTRIC Ranges! Look at prewar sales figures and they further emphasize this trend: Between 1933 and 1941, sales of Electric Ranges increased over 900%!

That leaves no doubt about it. Women *do* prefer the convenience, cleanliness, dependability and economy of modern electric cooking. And you can cash in on this preference by wiring your homes for Electric Ranges. Built-in, the cost of such wiring is negligible. But the selling power is tremendous!

* **WOMAN'S HOME COMPANION** survey shows that *more* women plan to buy an Electric Range than *any other type!*

* **McCALL'S MAGAZINE** readers made the Electric Range their 2-to-1 "must have" choice in a recent contest.

* **SUCCESSFUL FARMING** survey shows that nearly twice as many REA customers will own an Electric Range after *first two postwar years* as "now have" one.

* **HOUSEHOLD MAGAZINE** survey indicates that 3 times as many women want Electric Ranges as "now have" them.

* **COUNTRY GENTLEMAN** survey shows that among the upper two-thirds of white farmers, the Electric Range is the 2-to-1 choice!

Electric Range Section
NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
155 E. 44th Street, New York 17, N. Y.

A-B STOVES • ADMIRAL • ELECTROMASTER • ESTATE HEATROLA • FRIGIDAIRE • GENERAL ELECTRIC
GIBSON • HOTPOINT • KELVINATOR • MONARCH • NORGE • QUALITY • UNIVERSAL • WESTINGHOUSE

FOR EASIER SALES

wire your houses

FOR ELECTRIC RANGES

THE RANGE SERVICE OUTLET

A SYMBOL OF THE MODERN POST-WAR HOME

THE RECORD REPORTS

(*Continued from page 10*)

Buildings for the new plant will be of steel frame construction, with either masonry or reinforced concrete side walls, will enclose 43 acres of floor space. Huge, high-speed continuous "hot mills" and "cold mills" will be capable of rolling sheet up to 120 in. in width.

Banking quarters are on three floor levels, occupying a total of 10,400 sq. ft. The over-all decorative scheme on the main floor utilizes quarter-sawn oak, bleached to a light color, with plastered walls painted generally in pastel shades of green, with oak dado. Floor treatment is terrazzo in the public space, with green carpet on the officers' platform, depositors' area and private offices, and asphalt tile in the working area. The ceiling is treated with sound-correction tile, lighting is fluorescent, and all three floors are air conditioned.

Large new food processing plant for H. J. Heinz at Tracy, Calif., recently opened

Food Plant

Recently opened is a new H. J. Heinz food processing plant at Tracy, Calif. It has a floor area of 225,000 sq. ft., will employ about 1,500 persons during peak seasons. The plant is a brick, steel and concrete structure, designed by Louis Skidmore of New York.

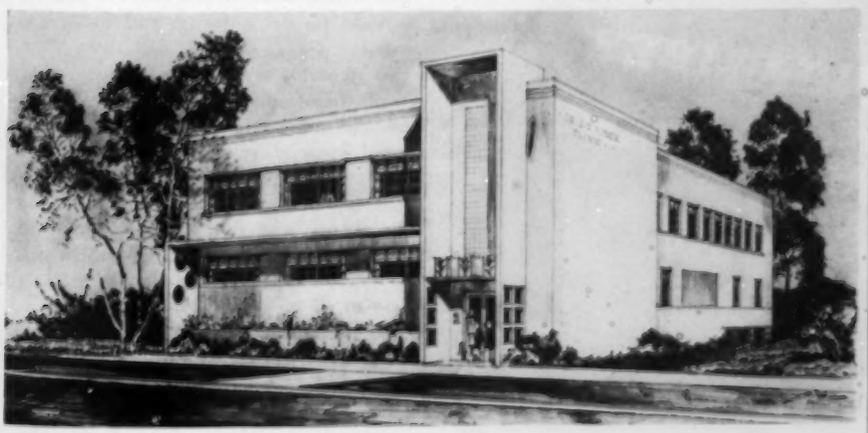
New Bank

The new Rockefeller Center office of the Bankers Trust Company, New York, which opened for business in June, embodies new developments in construction, design and color. Designed by Shreve, Lamb and Harmon, and built by the Turner Construction Company, the bank is without conventional marble or bronze, cages or bars. All cages and screens have been eliminated in the tellers' area by equipping each teller's space with a rolltop desk, invisible from the area in general use by the public.

Baby Products Plant

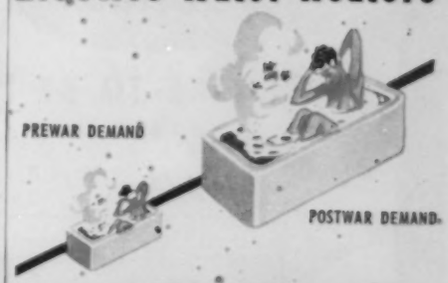
Planned by Johnson and Johnson for completion this summer, a new million dollar plant for the production of baby powder, oil, cream and lotions at Cranford, N. J., will include a special visitors' room from which mothers, doctors, nurses and child welfare groups may view the manufacturing process.

Production of the baby products will be centered in a single room in which every precaution has been taken against entry of dust and dirt. Air conditioning and purifying equipment is augmented by strips of thermopane insulating windows the entire length and breadth of the building. The exterior is of unglazed tile, trimmed with blue terra cotta and aluminum.



Wayland & Fennell, architects, write to ask that we remember that Idaho is one of the 48 states, and offer "the state's first modern clinic," planned for Caldwell, as a reminder

More and More Women Want *Electric* Water Heaters



The Trend is to *Electric* WATER HEATERS

In the 6 prewar years, sales of Electric Water Heaters almost tripled. And a 1944 survey made for NEMA* shows that three times as many women want Electric Water Heaters as now have them! They're "what women want," because they're:

SAFE—Flameless, fumeless

CLEAN—Smokeless, sootless

ADAPTABLE—Permit short hot water lines—Require no flue or vent

TROUBLE-FREE as electric light

ECONOMICAL—The cost is low for plenty of hot water all the time.

Installing Electric Water Heaters in every house you build, means giving women *what they want!*

Electric Water Heater Section
*NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

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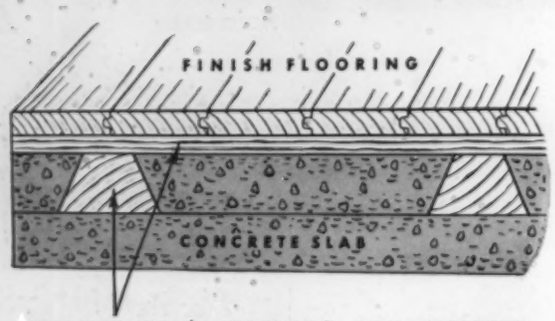
A House Wired For An Electric Range Is Already Wired For an

Electric

WATER HEATER!

Speaking of floors

WE LIKE TO BE IN THE MIDDLE



WOLMANIZED* SUBFLOOR AND SLEEPERS

Here's the spot—in the middle—where Wolmanized Lumber belongs. You don't want your floors to loosen, decay and crumble. Untreated lumber is food for fungus — moisture makes it grow. On Wolmanized Lumber decay fungus cannot grow—the Wolman Salts* preservative is fatal to it. Use Wolmanized Lumber generously on all subfloor construction . . . and you'll add years to the service life of your buildings.

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DRIVES PROTECTION DEEP

You can't just brush it on, you can't dunk it on . . . you've got to drive it into the fibers of the wood to get real protection. Here at American Lumber & Treating Company, we do it under great pressure in steel retorts. The protection is there for keeps.

*Registered trademarks

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THE RECORD REPORTS

(*Continued from page 10*)

which under the 1940 law are to be converted to low-rent use when the President finds that the war need has ended. The House Appropriations Committee, in considering funds for government corporations, points out that further contractual authority from Congress will be necessary because of the present $28,000,000 limit on housing subsidies.

While recommending rent subsidies on federal projects now under operation, the Committee plans during the next 12 months to have its investigating staff examine budget requirements of local housing authorities, the financial status of tenants, and, in general, make a check of the need for rent subsidies.

Selling FSA Units

Meanwhile, the Federal Public Housing Authority is disposing of units taken over from the Farm Security Administration. A few weeks back it announced acceptance of a $105,000 bid from a Baltimore furniture manufacturer, Belfort Corporation, on three industrial buildings and an inn at Arthurdale Homesteads in West Virginia. Sale of all the FSA projects, including the three "greentowns," is anticipated by June 30, 1948. Book value of the subsistence homestead projects is listed at roughly $22,000,000 and the three "greentowns" at just above $36,000,000.

Housing Bill Argued

As July rolled along, the House Banking and Currency Committee listened to arguments for and against the comprehensive housing bill sponsored by Senators Wagner, Ellender and Taft. The measure, passed earlier by the Senate, is designed to set up a permanent national housing agency, provide research and market analysis, authorize yield insurance in housing projects, reduce interest rates, extend the loan amortization period, assist urban redevelopment, provide public housing and aid rural housing.

In general, arguments to the House group followed those presented before the Senate Banking Committee. The National Association of Home Builders, incidentally, has issued a 32-page handbook for use of speakers, editors and community leaders on "What the Wagner-Ellender-Taft Bill Really Means."

Farm Buildings Studied

A report on farm construction, made to the Senate recently by its Small Business Committee, advises that prospects for such construction are the best in 25 years due to depreciation during the wartime years and the accumulation of

(*Continued on page 16*)

THE combined research, production and distributing facilities of three famous companies are now offered to American industry by The Colorado Fuel and Iron Corporation. Thus, a new nation-wide service is made available in steel, wire products, and allied specialties under the trade-marks of Wickwire Spencer, Calwico, and CF&I—each a standard of industrial progress in its own right.

The East and Middle West will continue to be served by Wickwire Spencer Steel Division. The Colorado Fuel and Iron Corporation will serve the Plains and Mountain States with CF&I facilities as before plus the products of the eastern and western divisions. The California Wire Cloth Corporation (a subsidiary) will supply its own products and in addition the products of the other two divisions to Pacific Coast customers.

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For further information, write the Atlas White Bureau, Universal Atlas Cement Company, (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

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U. S. STEEL RADIO SHOW—*Sunday Evenings—Consult your local newspaper for time and station.*

THE RECORD REPORTS

(*Continued from page 14*)

large cash reserves. Says the report:

"Prospective expenditures for construction averaging $940,000,000 annually for the years 1946 to 1950 as estimated on the basis of past relationship of expenditures to farm income, indicate a farm building boom to compensate for the years of subnormal expenditures. This will, of course, mean replacement of many old buildings and improvements of others reported in poor condition, but the estimates provide only for bringing the farm plant up to normal and not for elimination of all substandard buildings."

Prefabrication Queried

Besides farm dwellings the report calls attention to inadequate shelter for livestock and machinery, insufficient storage capacity, and modernization for animal care, but foresees little prospect that costs of farm buildings can be reduced by prefabrication "in urban plants with high wages and high distributing costs."

Citing the cooperative experience in rural electrification and the absence of farm building cooperatives, it states that "construction of farm buildings offers a much greater opportunity for farmer self-help . . . because a larger proportion of materials for buildings are available locally and a large proportion of total labor in the finished product is labor at the site."

Rural Research Cited

The report discusses research in functional requirements as an aid to farm construction, listing five points in particular:

1. Preventing unnecessary heavy building maintenance costs.
2. Better space arrangement, lighting, heating, and food-storage facilities.
3. Better service building arrangement.
4. Improving livestock health by sanitary housing.
5. Reducing loss of fruits and vegetables, due to freezing and decay in storage, by control of temperature and humidity.

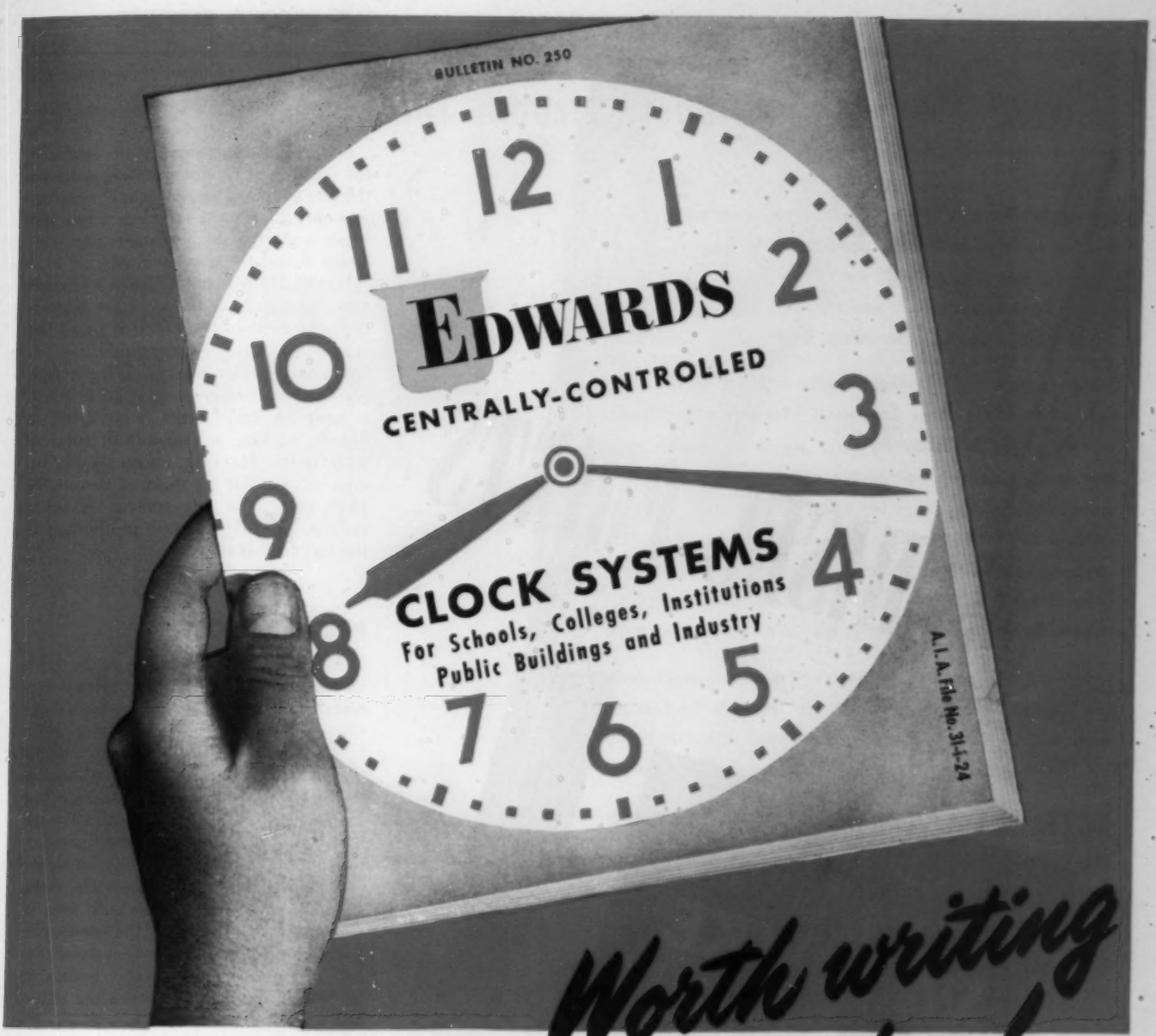
Agency Actions

From various federal agencies come construction notes of interest:

An indication of the building backlog is given in the CPA announcement that it handled more than half a million inquiries and applications for non-housing construction in the first 11 weeks under its building control order and turned back more than 450,000 projects.

FPHA allocations of temporary emergency dwelling units for veterans have passed the 199,000 figure. Completion of

(*Continued on page 18*)



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Accurate, trouble-free operation is assured by the famous Telechron self-starting movement which is automatically and dependably synchronized by alternating current. No contacts, rectifiers, relays, pendulums, keys or switches to get out of order—no master clock to be maintained, regulated and serviced.

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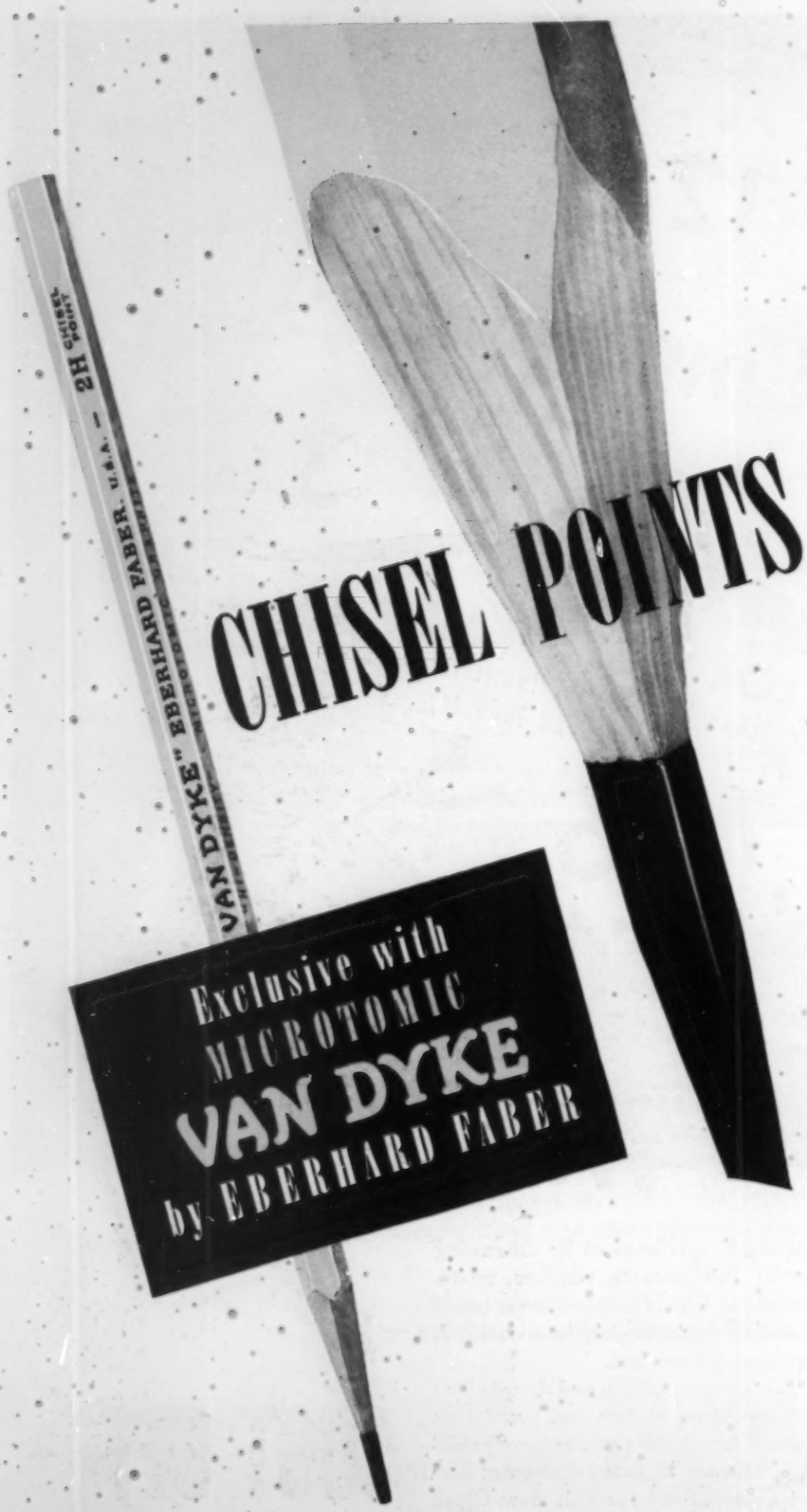

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Chisel Point Leads come in degrees: 6H, 4H, 2H, HB, 2B, 4B. Round Leads in 18 degrees from 9H to 7B.

THE RECORD REPORTS

(*Continued from page 16*)

200,000 is called for by the end of the year.

A Census Bureau sample survey shows the number of vacant dwelling units on the sale or rental market last November was only 1 per cent in urban areas and 2 per cent for the country. The condition is said to be worse now.

NHA advises that Mayor's Emergency Housing Committees are operating in more than 340 cities to speed the current construction program.

Census Bureau reports an 8 per cent increase in housing-type trailers in April, a jump to 2,679 units from 2,488 in March, making a four-month total of 9,800 units. The rate, unless sizably increased, will fall far short of the 50,000 1946 goal. The government is using priorities to help increase production in the last half of the year.

❖ ❖ ❖

RESEARCH HOUSE

The first research house to be built at the University of Illinois Home Research Center will be a one-story 5½-room modern home. A cooperative project of the University and the National Warm Air Heating and Air Conditioning Association, the house is being built primarily for the study of warm air heating. It will be typical in size of present-day houses, will be completely furnished and occupied. To give scientific data, four miles of wires will be built into it, connecting more than 200 thermocouples with a central switchboard for determining temperatures at many points in the rooms, in and on the heating plant, and inside of the walls and other parts of the structure itself.

The first heating plant to be studied will be a conventional forced-air system whose main trunk duct, instead of diminishing in size with distance from the furnace as in conventional construction, will be the same size throughout its length.

The basement of the house will be arranged so that it can be separated from the rest of the house, and the heating plant put into the utility room for studies of homes having no basements but with space under the floor. The floor will be built with steel joists so that floor panel heating can be tried. Walls will be built with panels instead of plaster, to permit easy changing of ducts and equipment.

Housing Project

The contract for the construction of the New York Life Insurance Company's 3,200-unit garden type apartment housing development at Fresh Meadows,

(*Continued on page 134*)

A BETTER BEGINNING FOR A HOME, APARTMENT OR LIGHT INDUSTRIAL BUILDING

BUILD WITH STRAN STEEL

Any structure that begins with Stran-Steel has a long, money-saving future ahead of it. Built around a fire-safe, all-steel frame that cannot rot, warp or sag, it will spare the owner the expense and inconvenience of cracked walls and sagging floors.

The Stran-Steel method makes lightweight steel framing extremely practical and economical for light-load buildings, and permits full play to the architect's skill. Joists, studs and channel plates are pre-cut to desired lengths for quick, easy erection on the site, without the use of special tools or equipment. By means of the patented *nailing groove*, collateral materials are nailed directly to the frame, and held there in a grip stronger than that of wood.

Investigate the full story of Stran-Steel framing. Complete details are contained in Sweet's File, Architectural, Sweet's File for Builders, or the January issue of Building Supply News.

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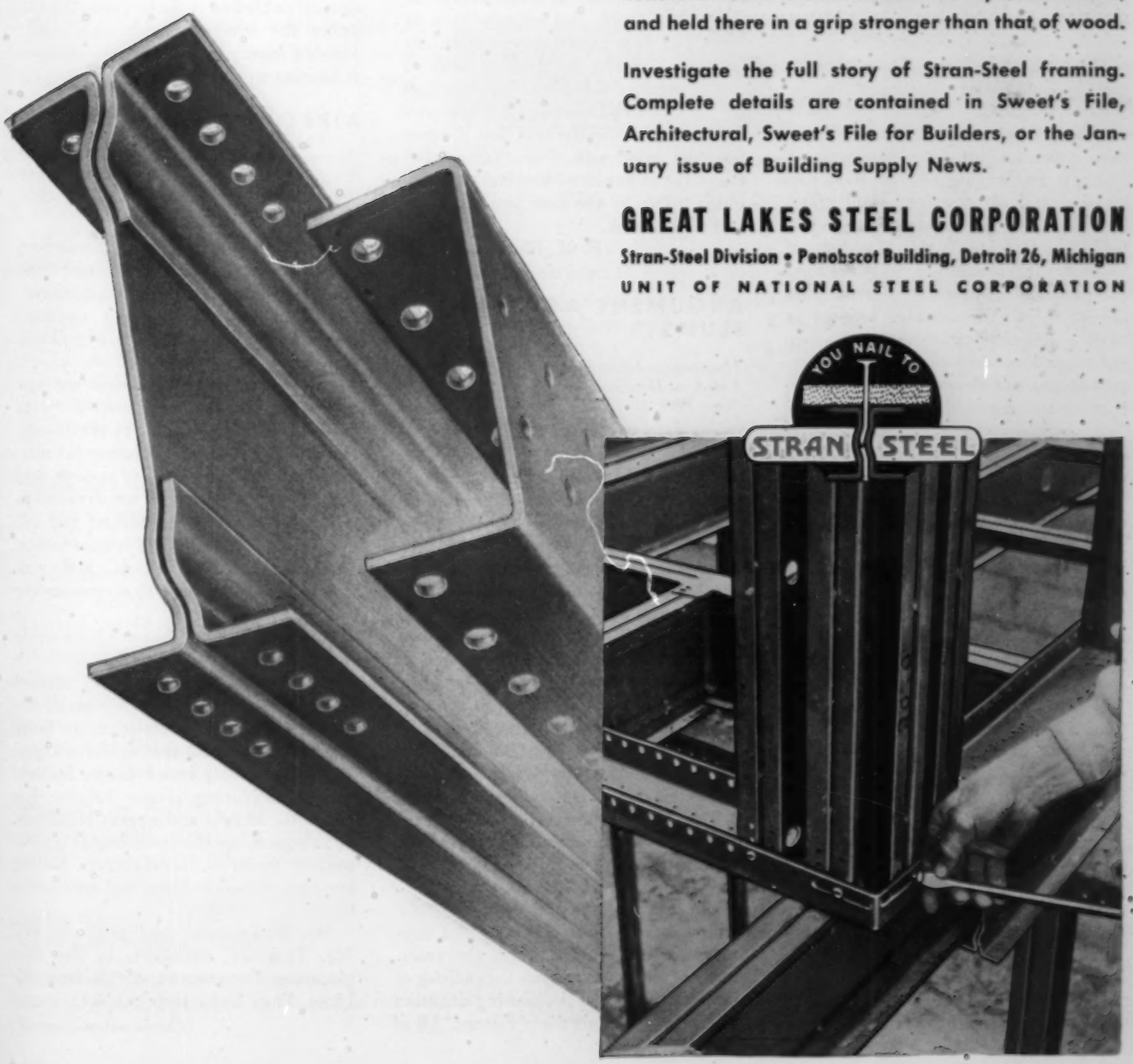

REQUIRED READING

FOR BETTER HOSPITALS

Hospital Planning. By Charles Butler, F.A.I.A., and Addison Erdman, A.I.A. New York 18 (119 W. 40th St.), F. W. Dodge Corp., 1946. 8½ by 11 in. xx + 236 pp. illus. $15.00.

This book, from the pen and pencil of two scholars in hospital architecture, is no blueprint for universal application. It avoids the fixed formula which only the unthinking reader might be seeking, and is a stimulating addition to the literature of this subject in an era of imminent, though somewhat expansive, postwar planning. The atmosphere of change which dominates our society these days is amply reflected in its pages, and this is one of the first merits of the book.

Hospital construction in America since the turn of the century, when the social sciences began to apply the lessons of physics, chemistry and biology learned previously, has been characterized by efficiency of design, and patient-comfort, to a degree which made the effort much more elaborate and therefore much more expensive in this country than in Europe. We have been taunted by the Old World for the provision of luxuries which, in their eyes, amounted to extravagance. There is no denying that we have had massive and often monumental examples of American achievement in this field. The late Dr. W. H. Mansholt, of Gronigen, in a classic address to the First International Hospital Congress, later published in *Nosokomeion*, accused us of exceeding that optimum point in capital expenditures for hospitals where returns begin to diminish sharply in proportion to the additional capital sunk in "brick and mortar." Looking at the swimming pools in some of our nurses' residences he once remarked, as an aside, that, in the reincarnation, he hoped to come back as an American nurse. It is another merit of this book that it feeds no fuel to such complaints and proceeds calmly, almost in a conversational tone, to advise us at a critical hour how to plan sensibly, profiting by the experience of others, which the authors are at special pains to evaluate for us.

Beginning with an all too brief summary of trends, as seen from the technician's point of view, and unfortunately omitting a bibliography, the authors proceed with a selection of material for the consideration of hospital trustee, executive, architect and builder, reminding them at every step of the importance of collaboration with each other, and with the professional staff involved, starting from the earliest time when a site is being considered, till the hospital is functioning, and beyond.

The text, which the non-professional hospital worker can read with ease (though the doctor will know that a patient is tuberculous and not tubercular) is amply illustrated, as if in answer to the prayer, "Draw me a diagram." There are moments when some will disagree with the thesis as, for example, in the relative desirability of the inside operating room artificially illuminated, but, on the other hand, the authors do not stress the point too insistently and always leave room for better judgment to prevail, depending on local needs and preferences. In the older diagrams, errors learned through the years, after actual use, might have been recorded more fully, but the reader cannot expect too large a mass of detail in a readable volume of only 232 pages. Which is another way of saying that Dr. Butler and his co-author, Mr. Erdman, have given us an excellent introductory volume which no hospital worker, or general practitioner in architecture can afford to overlook. Not since the Stevens volume and the piecemeal contributions of the pioneering Goldwater, both of whom inspired this book, have we had such learned and convincing words in a field which invites the best that the professional mind can offer. You understand the elements of hospital planning much better by the time you reach the end of this book.

— E. M. Bluestone, M.D.

ARGUMENT AGAINST SLUMS

Housing and Citizenship . . . A Study of Low-Cost Housing. By George Herbert Gray. New York 18 (330 W. 42nd St.), Reinhold Publishing Corp., 1946. 8½ by 11¼ in. xiv + 254 pp. illus. $7.50.

Whether the slums make the people, or the people the slums is a question almost as insoluble as the age-old riddle of the chicken and the egg. Modern opinion tends sharply, however, toward putting the slums first. Certainly it has been proved often enough that the miserable conditions of overcrowding and filth of a slum area are breeding places not only of disease but of crime and low moral standards. Citizens of such areas, by and large, are very poor citizens — and no pun is intended. It is upon that premise which Major Gray has based this detailed argument for better housing.

This is no ordinary housing survey. It starts with a thorough study of the historic and philosophic background of the housing problem, describing the origin of the slums and their character and what has been done toward conquering them down through the years. It then goes on to discuss the policies of public housing and the housing situation in England and northern Europe. All of this is good basic material, but nothing especially new.

Part II, however, delves into the less frequently analyzed matter of the social, economic and technological background of the people to be housed. Major Gray here has made a valuable contribution to the subject. With graphs and tables he shows what families at various income levels spend for various items, including rent and food. He tells how incomes vary from one section of the country to another. He discusses graded and adjusted rents and rent certificates. He points out at what income level a family needs help in paying for adequate shelter. He devotes a whole section to the cost of housing and rent, and another to the design of low-cost housing. And finally he sums the whole situation up with a review and an an appraisal of the accomplishments of the federal housing agencies.

Major Gray's contribution in this volume is not so much in presenting new material — he makes full use of studies already published — as in gathering together the whole story in one place. This is a book which the serious student of housing will find invaluable.

AIRPORT KNOW-HOW

Airport Planning. By Charles Froesch and Walther Prokosch. New York 16 (440 Fourth Ave.), John Wiley & Sons, Inc., 1946. 8½ by 11 in. xii + 250 pp. illus. $7.00.

As the authors point out, for airport planning the architect needs more than his normal knowledge of building accommodations and the highway engineer more than his knowledge of road building in order to design and build an airport. To these must be added a clear conception of the relation of the aircraft to its landing facilities in order to create efficient and enduring accommodations. Sizes and characteristics of present and planned types of aircraft are detailed in order to acquaint the architect and engineer with their physical requirements, dimensions, landing speeds, and runway lengths neccessary to accommodate them.

Every effort seems to have been made to make this a complete and all-inclusive analysis of basic problems in airport planning and design, from the small airport designed for owner-pilots to large commercial ones for metropolitan areas. It treats not only broad design factors, such as achieving proper balance between the airfield and airport buildings, but also such specific problems as traffic-control facilities, fire-fighting, fueling systems, snow-handling, and turf-maintenance.

Mr. Froesch is chief engineer and Mr. Prokosch, architect, in the Engineering Department of Eastern Air Lines. They know their subject.

(*Continued on page 28*)

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ALWAYS Pb_3O_4... *that's why*
it's a Dependable Metal Paint

Industry has yet to discover a better metal protective paint than Red Lead. This is due to inherent fundamental properties of the pigment itself.

Among the most important of these are Red Lead's definite chemical composition and its purity, as distinguished from pigments that have indefinite composition or vary from batch to batch, with resulting possibility of variation in performance.

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Uniform performance means predictable chemical behavior—dependable performance as a rust-inhibitive paint, day after day, job after job.

Furthermore Red Lead has the property of controlling acid conditions recognized as accelerators of rust. In the presence of various acids, Red Lead forms insoluble lead salts, at the approximate rate at which the acids are supplied. This is true whether the acids originate from acid forming environments, such as gas, smoke, and moisture in the atmosphere, or from the oxidation of the paint vehicle.

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The value of Red Lead as a rust preventive is most fully realized in a paint where it is the only pigment used. However, its rust-resistant properties are so pronounced that it also improves any multiple pigment paint. No matter what price you pay, you'll get a better paint for surface protection of metal if it contains Red Lead.

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THEY ALL REVOLVE . . .
the warmth-giving Sun . . . the life-producing Earth
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Like the sun, the earth, the atom, the Wing Unit Heater REVOLVES. It keeps the heated air in gentle motion, slowly circulating a constant, uniform, EVEN temperature, transforming hot and cold spots into comfortable, energizing, productive areas. The circulating heated air from the slowly revolving discharges reaches to farthermost corners, gets around and under obstructions, eliminates hot spots and cold spots.
Install Wing Revolving Unit Heaters now. Not only will they heat your plant comfortably and evenly, bringing a sensation of fresh, live, invigorating warmth to workers, but in the Summer, with the steam turned off and the fans on, they create a pleasant, cooling air motion over the entire area.
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REQUIRED READING

(*Continued from page 26*)

THE LEGAL SIDE

Legal Phases of Construction Contracts. By I. Vernon Werbin. New York 18 (330 W 42nd St.), McGraw-Hill Book Co., Inc., 1946. 5 by 8 in. x + 268 pp. illus. $2.75.

The architect, engineer or contractor who masters this textbook should be able, by and large, to steer clear of the many pitfalls of contracts. It is based on actual court cases, and covers 46 different legal problems. In many cases the terms of the contract and the facts of the situation are given in detail to aid in lay understanding.

Mr. Werbin, himself a lawyer and an associate member of the American Society of Civil Engineers, is thoroughly familiar with the way such problems arise, and so has been able to describe them and analyze the court decisions resulting from them in terms which any layman readily will understand. Subjects covered include: damages for delayed performance; contract provision for a written order for extra work; right to recover for increased cost of work due to unforeseen conditions; damages recoverable for breach of contract; damages recoverable upon the discharge of contractor; validity of contract; provisions for submission to arbitration of all disputes arising out of the contract.

City Planning

RICHMOND

A Master Plan for the Physical Development of the City. Richmond, Va., City Planning Commission, 1946. 9 by 12 in. 280 pp. illus.

With its many maps and charts, and its many pages, this is one of the largest and most pretentious of the many volumes published to date by city planning commissions the country over. It represents a vast amount of work: research, study, and the most careful analysis; and it demonstrates a firm understanding of what makes a city tick.

The pattern followed by the Richmond commission in presenting their plan is the usual one: the background of the city, its physical characteristics and its population; an analysis of its population trends; land use and zoning; housing, street plan, transportation facilities, parks and recreational areas; and a proposed civic center. A refreshing difference between this volume and its cousins is the total lack of heartpull photos in the discussion on housing. There is not a single illustration of the shocking tenement conditions or of the advantages of public housing. Not that Richmond is not aware of the need of better housing

(*Continued on page 30*)

ARCHITECTURAL CONCRETE

This is the first of a series of illustrations by Hugh Ferriss demonstrating the adaptability of Architectural Concrete for apartment buildings — hospitals — schools. Architectural Concrete combines architectural and structural functions in one economical, fire-resistant material. Watch for future illustrations and details.

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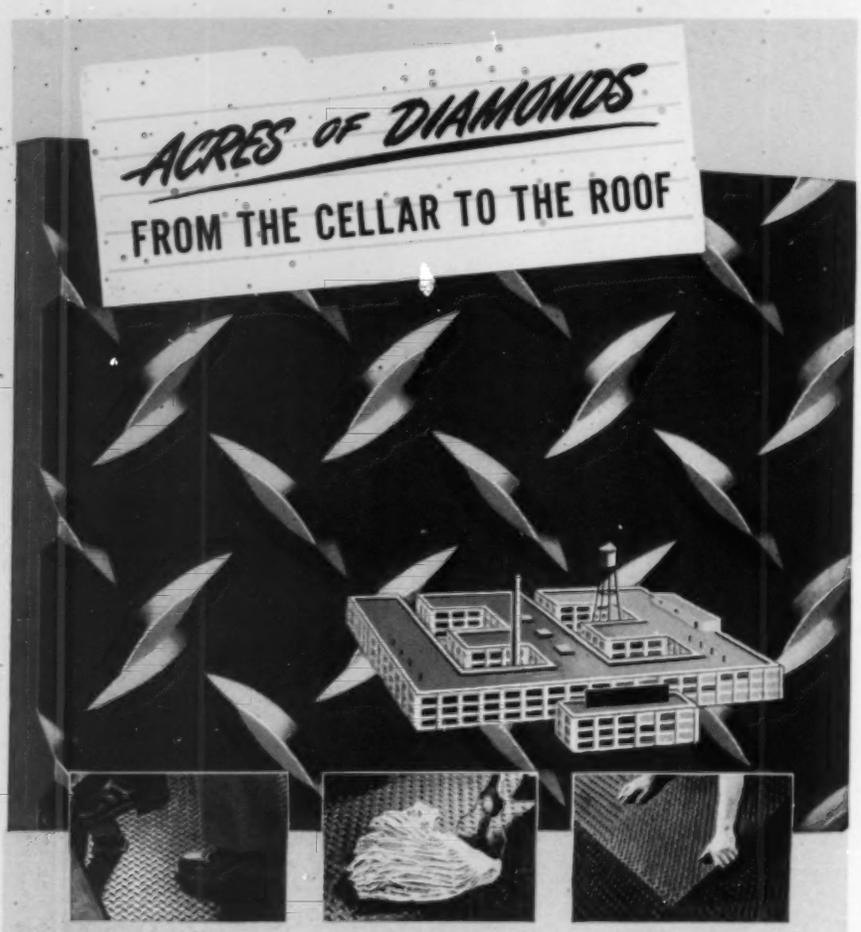

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REQUIRED READING

(*Continued from page 28*)

— its planning commission simply prefers to state the facts rather than dramatize them.

This is a forward-looking and quite workable plan which Richmond has developed. It is, as the foreword states, "a pattern of patterns, built upon the sound foundation that foresight is progress; that while traditions are glorious they often consort with self-complacency. Traditions are for the most part static, but progress is dynamic. Traditions often lead us to the state of mind of being 'penny-wise and pound foolish.' "

LOS ANGELES

Watertines: Key to Development of Metropolitan Los Angeles. Prepared by Charles W. Eliot. Los Angeles 7 (2324 S. Figueroa St.), Haynes Foundation, 1946. 9 by 12 in. 38 pp. illus. 50 cents.

Here is another careful Haynes Foundation report on California planning, this time stressing the importance of water in Los Angeles' development program.

The problems as stated are the familiar ones of too little water and too much water. The solutions offered are plans sponsored by various official agencies. What already has been done is described and analyzed.

NEW YORK

New York and the Future. New York (16 Wall St.), Bankers Trust Co., 1946. 7½ by 10 in. 52 pp. illus.

While not strictly speaking a book on city planning, this attractive little volume issued by the Bankers Trust Co. is concerned with just that. For what it is interested in is the business side of the metropolis — not just Wall Street finance, but the "business head" behind the city's development.

It is an unusual book for a banking concern to put out. It is, as it says, a story about New York, "the story of what New York is really thinking about in terms of its postwar job." It tells of the new building projected for the city; of the types of business which occupy its citizens; of its transportation by land and sea and air, by subway and bus; of its communication facilities, its educational and recreational centers; of its entertainment. Nor does the story stop there. The city's postwar budget is discussed. The housing program is commented upon. And at the end the whole thing is summed up with a few well-put paragraphs stressing the fact that the keynote of planning must always be a realization that in the last analysis, a city is made up not only of brick and stone, but of the people who work and live and die within its confines.

ARCHITECTURAL

RECORD

THE ARCHITECT AND THE HOSPITAL

THERE are three reasons why the subject of hospitals and their architects looms large at this time; one reason is of national importance, one is professional, and one, I must admit, is highly personal.

The personal reason points up in one's mind the importance of both the necessity for carrying out an extensive and integrated public health program and the necessity of employing the best architectural and engineering talent in the country to design the hospitals and health centers.

As this is written it seems that the Congress may take definite action on Senate Bill 191 before the session ends this summer. This bill proposes a plan for developing a hospital and health center program that would more adequately serve the nation by providing facilities that would reach from the great medical centers in the big cities to the rural communities in a coordinated and comprehensive way. It is concerned with providing the physical facilities for both the prevention and the treatment of disease. (See ARCHITECTURAL RECORD, August, 1945, pp. 104-124.)

The necessity of employing the best available talent for hospital planning is realized by the medical profession, the American Hospital Association and the architectural profession. The A.H.A. is to be heartily commended for its efforts to see that only competent architectural and engineering firms are employed in this highly specialized and technically complicated field. And the A.I.A. should assist in this effort in every way consistent with the ethics and policies of the profession. At the recent A.I.A. convention the question of prepared lists of architects competent to design hospitals was settled. (ARCHITECTURAL RECORD, July, 1946, p. 144.) There was no assertion in the debate that all registered architects were equally competent to design hospitals. That obviously would be ridiculous. The point, in disapproving the publication of lists of hospital architects (largely on the basis of having previously designed hospitals) was that such lists would tend to preclude the employment of brilliant, competent, imaginative and ingenious architects merely because their experience was previously in other fields. Through research, vicarious experience, published hospital studies, conference, consultants and the application of their creative abilities, firms which had never before designed a hospital could conceivably produce the most effective designs. And this does not belittle the value of experience in the hospital field.

One form of experience is that of being a patient (recently enjoyed by the writer). And in the final analysis hospitals are for patients, as well as for doctors, nurses, dietitians and administrators. Through such an experience (which I recommend be vicarious but thoughtfully and sympathetically analytical), the architect can determine room sizes, relation of beds to windows, locations and types of lighting fixtures, nurses' call systems, sound control, and all the conveniences and comforts that contribute to the speedy recovery of the patient. There is still much to be learned and present standards should serve as springboards to constant improvement. Present standards are worthy of most conscientious study and the results of research presented in published form are of inestimable value.

Hospital design offers a challenge to the best thought of the profession. It is a field not to be entered lightly but soberly, imaginatively, solemnly and in the fear of God — but with the knowledge that a job well done is a major contribution in the service to humanity.

Kenneth K. Stowell

EDITOR

AN ADVANCED SMALL-CITY HOSPITAL

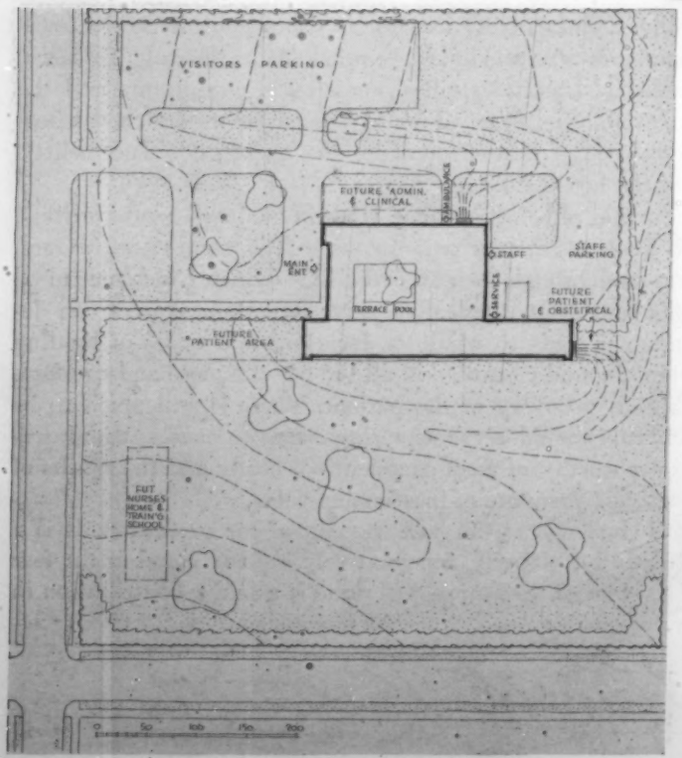
THIS excellent scheme for an up-to-date general hospital grew out of a rather typical current problem. The hospital which this is to replace is the smallest of three in the city — 35 beds — and is not suitable for alteration or addition. It was built in 1904 and is thoroughly obsolete. And its site is too close to downtown and too small for a modern hospital.

The architects were consulted at the beginning; and, after a thorough examination of the hospital and the community, recommended that a new site be selected, preferably of not less than 10 acres, away from the center of town and in a residential community. Such a site was found just at the last street, with town on one side, farm land on the other, and yet it is within 10 minutes of downtown by auto. And it works out to balance nicely the various hospital facilities in the city.

Since there was ample space for privacy, south orientation for patients' rooms was considered of prime importance, and except for two wards, this orientation was possible. A three-foot overhang protects the rooms from the hot sun in summer and admits as much sun as possible in the winter.

Another matter considered of major importance was traffic throughout the building. The lot falls off from the southwest to the northeast, permitting

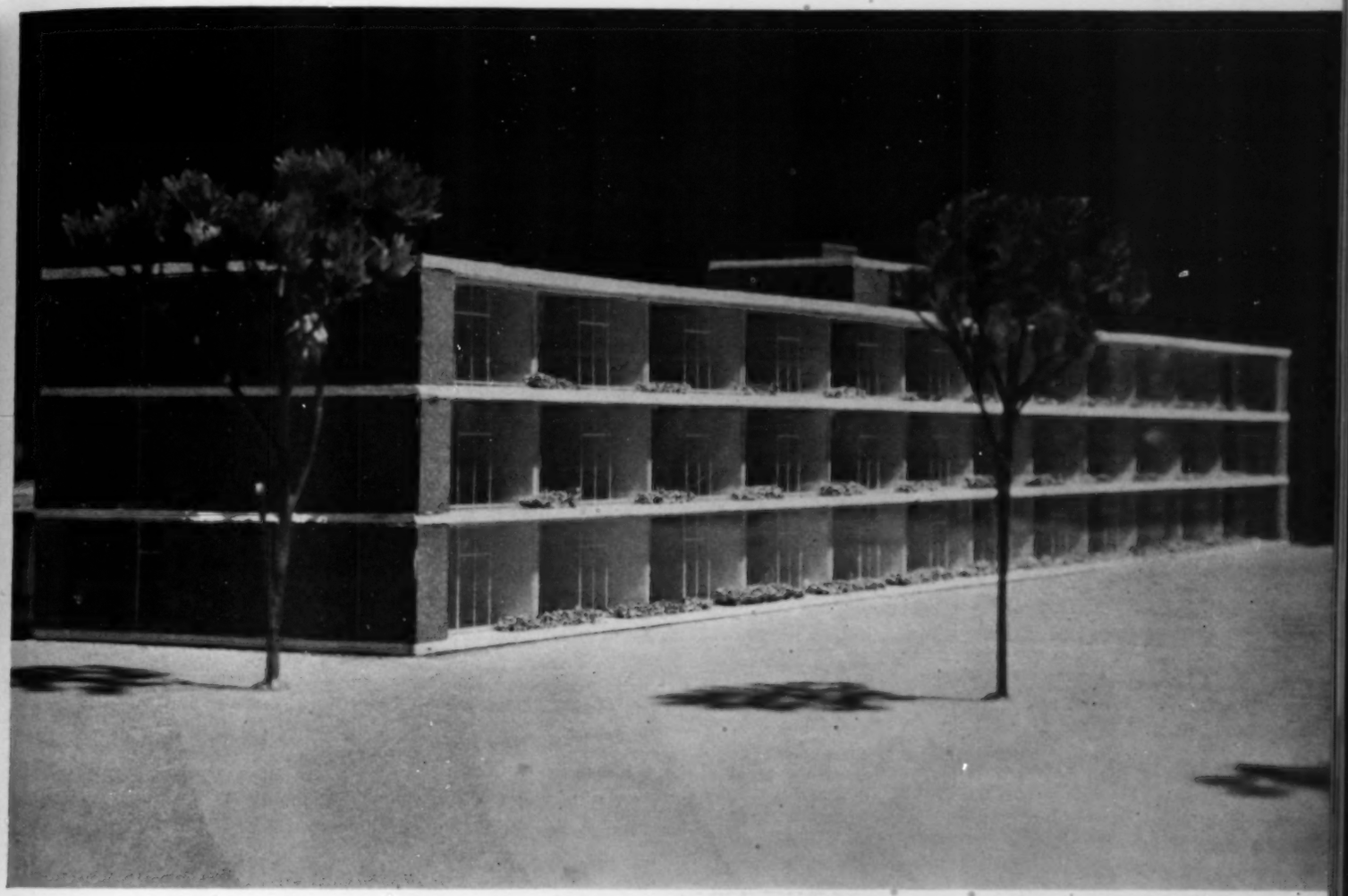
HEDRICH-BLESSING Photos



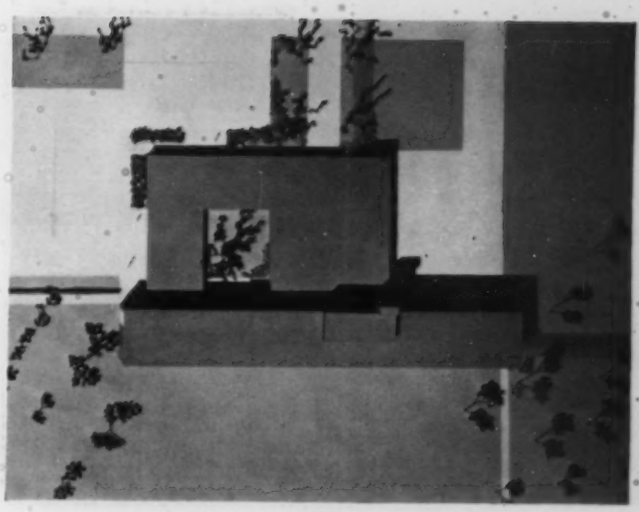
kitchen and laundry to be placed at a lower level, but still above grade, and keeping service traffic out of the main building. All adjunct services — X-ray, physio-therapy, pathological laboratory, etc. — are on the same level as the main entrance, keeping outpatient traffic off the elevators. Surgery is also on the ground floor, convenient to adjunct services. And surgical patients' nursing rooms will be on the ground floor, eliminating virtually all elevator traffic for this department. This location also makes the surgical department accessible to the emergency rooms. The administrative unit is located between main and ambulance entrances. Obstetrics, nursery and maternity patients will occupy the entire top floor; this arrangement will keep traffic to a minimum and thus keep down the danger of cross infection.

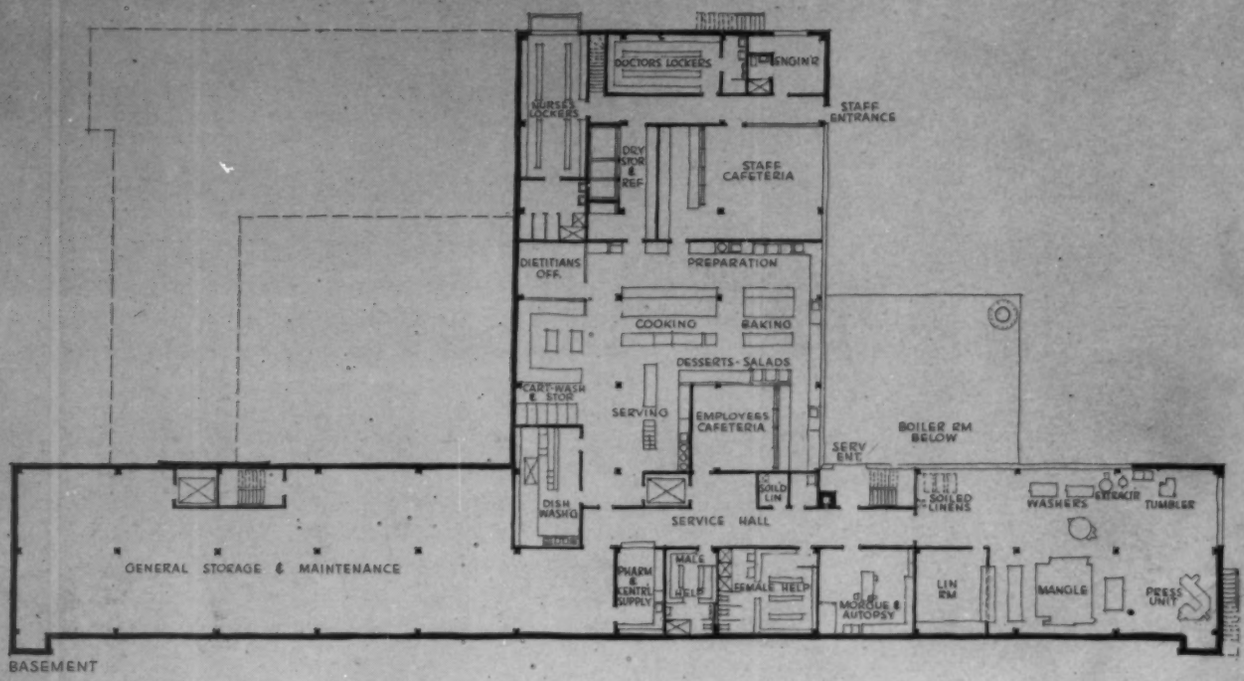
Proposed General Hospital for Presbyterian Hospital Board, Waterloo, Iowa

Skidmore, Owings & Merrill, Architects & Engineers

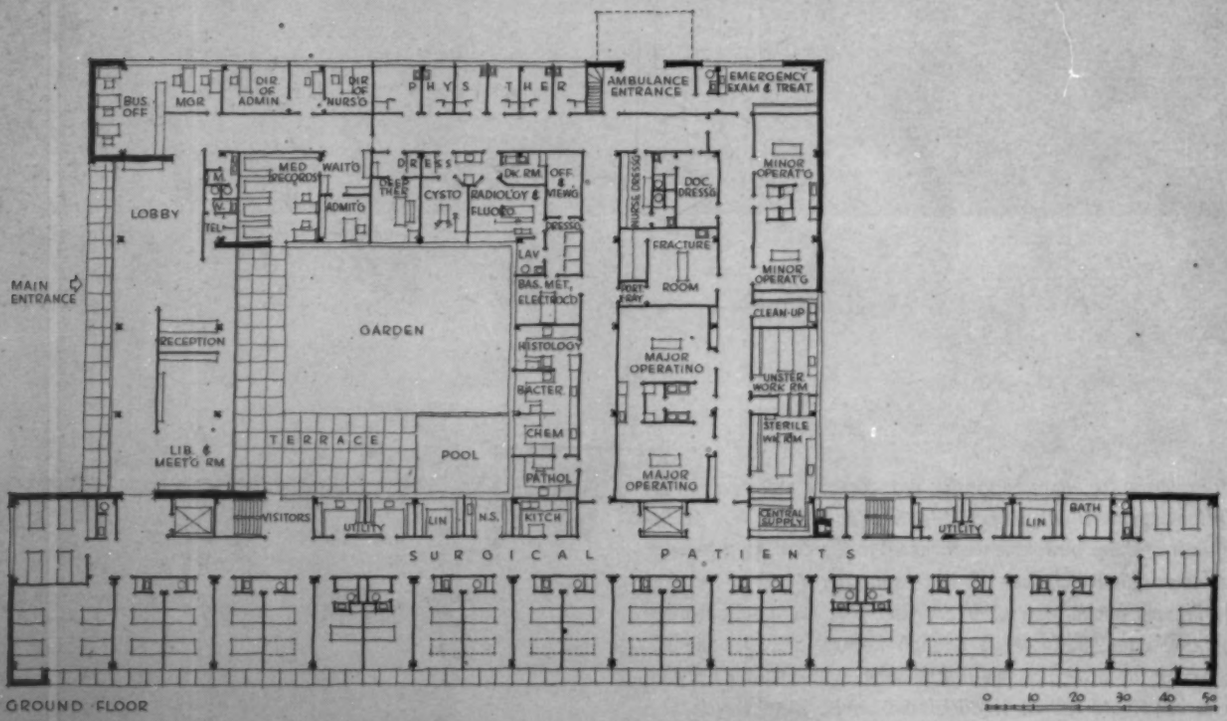


Proper provision for future expansion was a major objective in the search for the site. It will be possible to extend the patient areas to the west and the obstetrics department to the east, and to add space for additional clinical services to the north (top of the site plan). Present kitchen and laundry facilities, on the basement level, have been made large enough for up to 200 patients. Present capacity now planned is 108 beds, with one-third of the patients in private rooms. If all of the semi-private wards are occupied by two patients, the capacity will be approximately 140



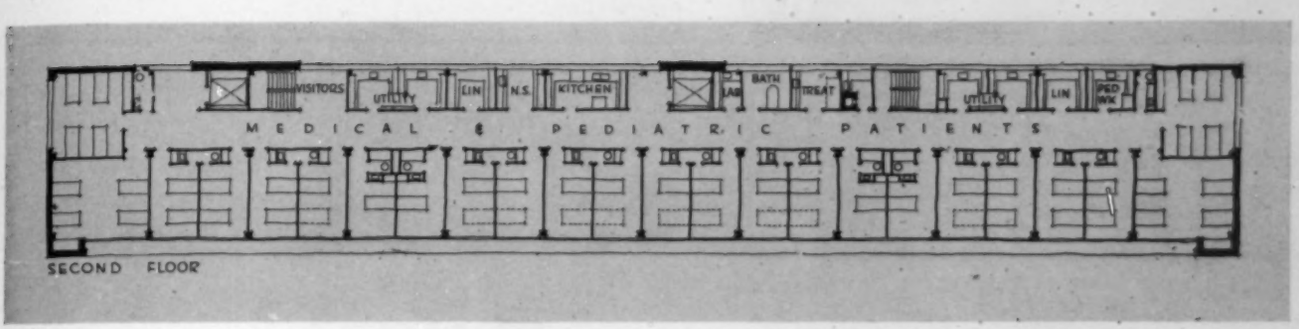


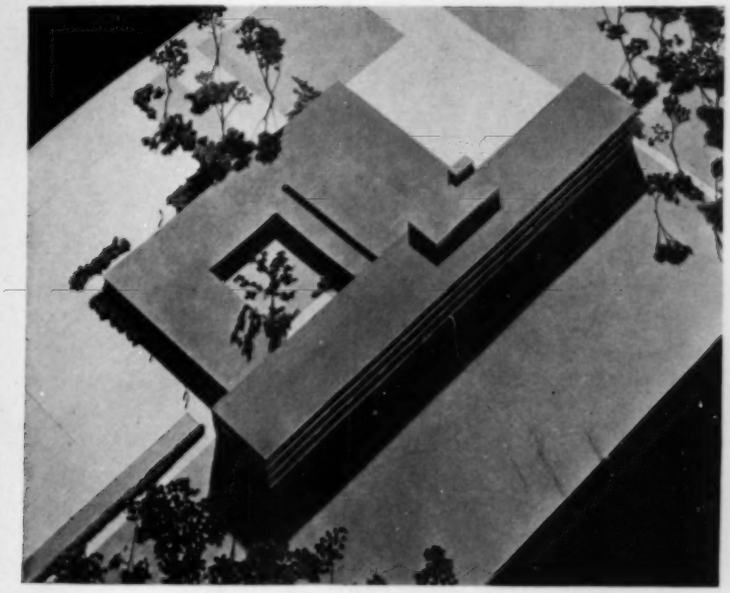
BASEMENT

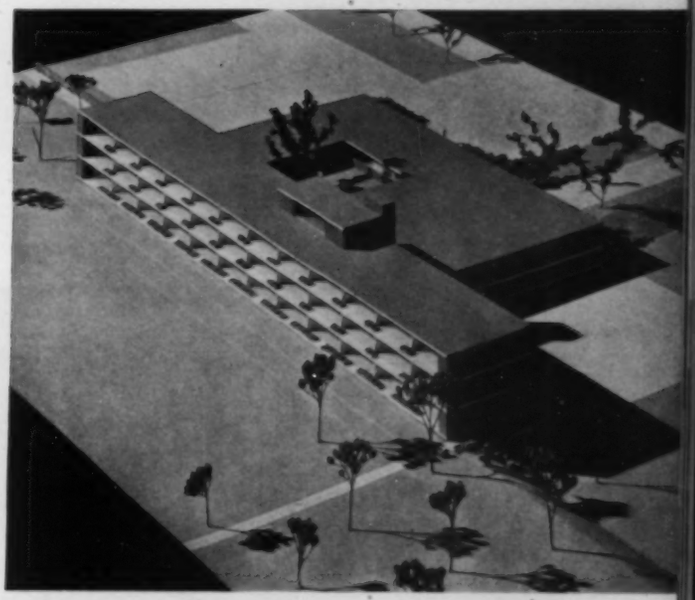


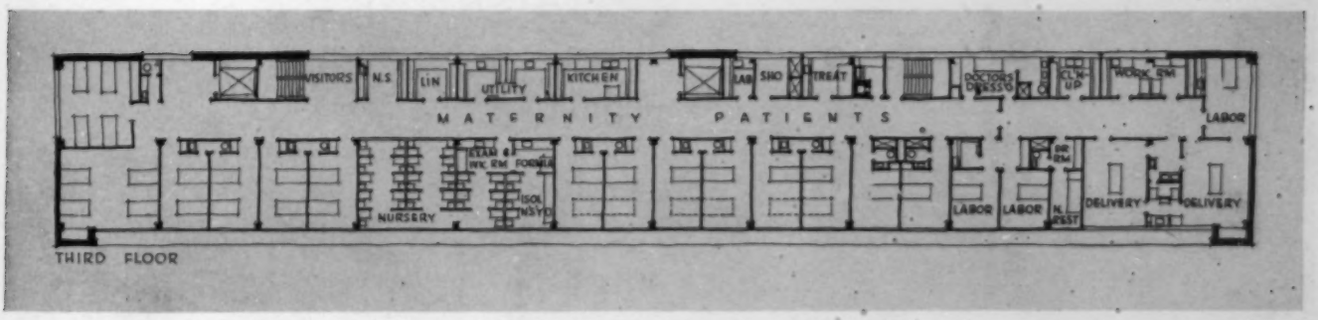
GROUND FLOOR

The "offset corridor" scheme gives the patient rooms the best orientation, but it imposes on the architects the need for careful attention to nurses' travel to be most economical of their time and energies. Here a lavatory and toilet are available to every patient's room or ward, so that bedpans need be taken out only for sterilization

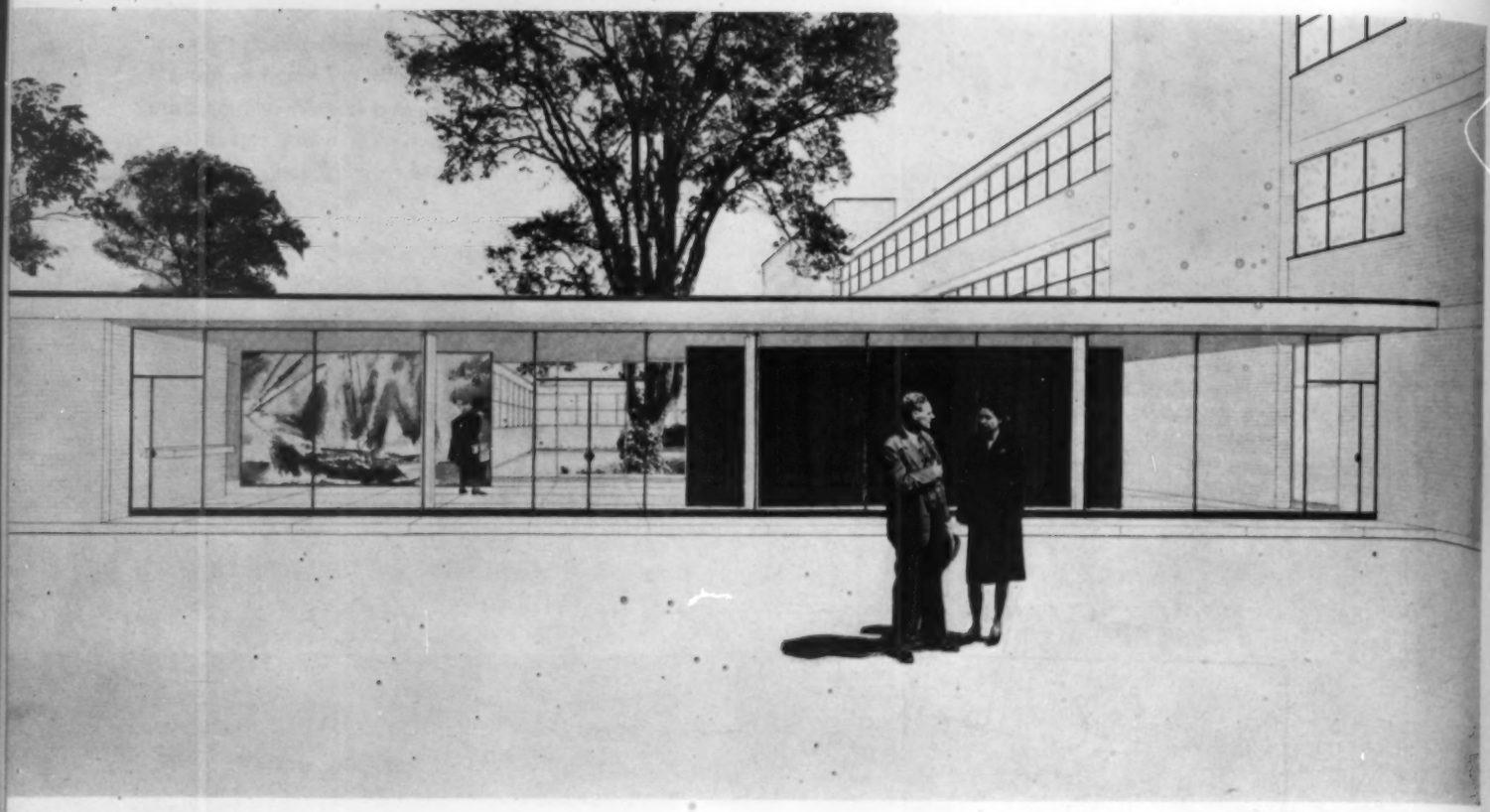


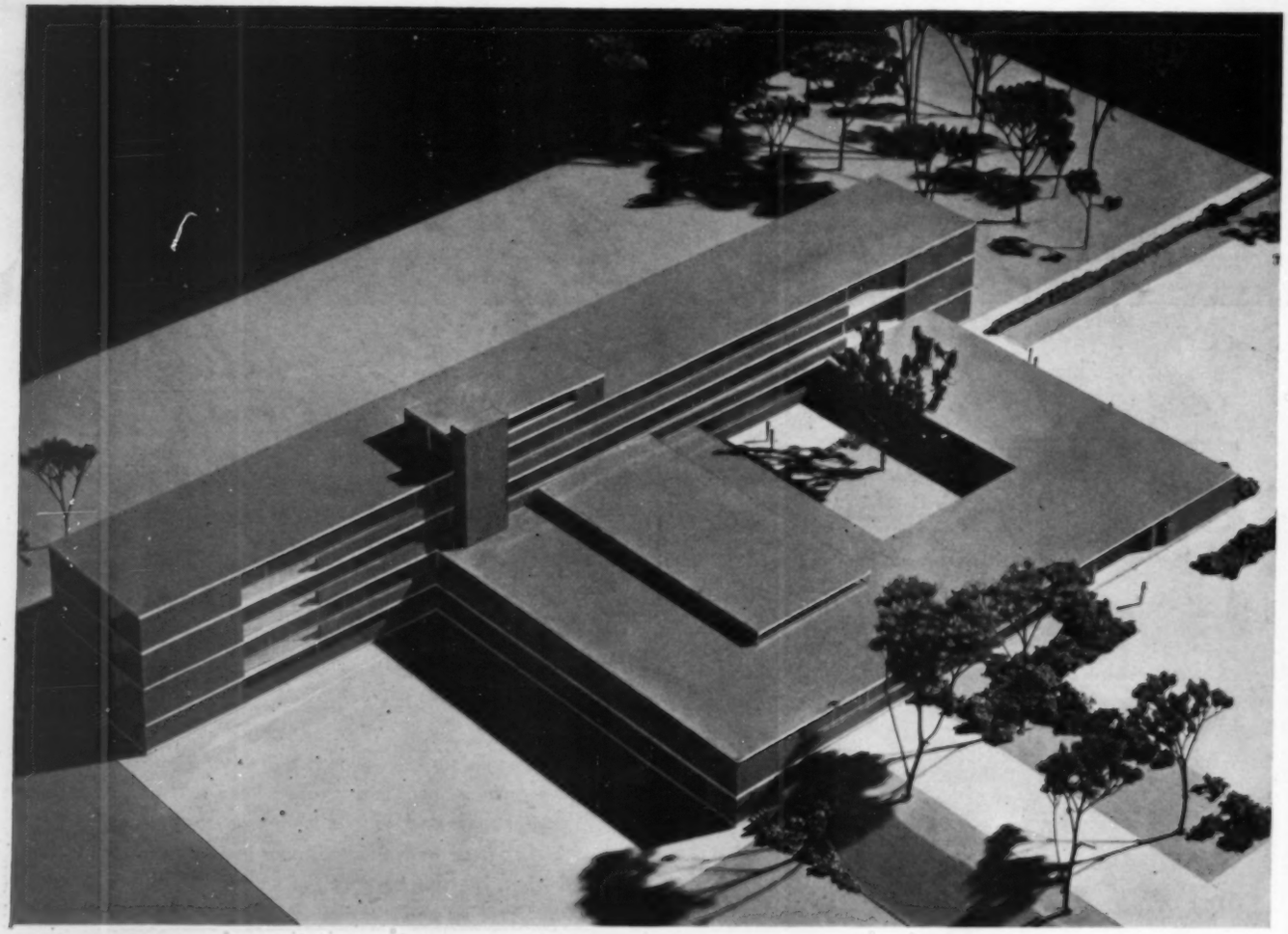


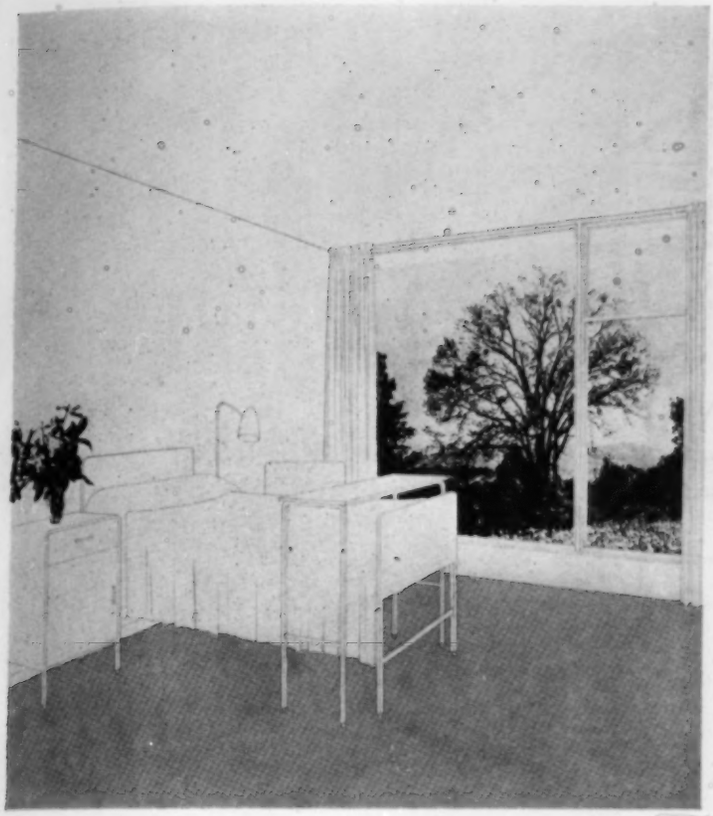




The single nurses' station is placed at the visitors' end of the corridor, but there are two linen and storage rooms, one at either end, to save the nurses many steps. The floor kitchen is centrally located, near the service elevator. The kitchen is small because the central tray system is used, with cooking and dishwashing in the central kitchen

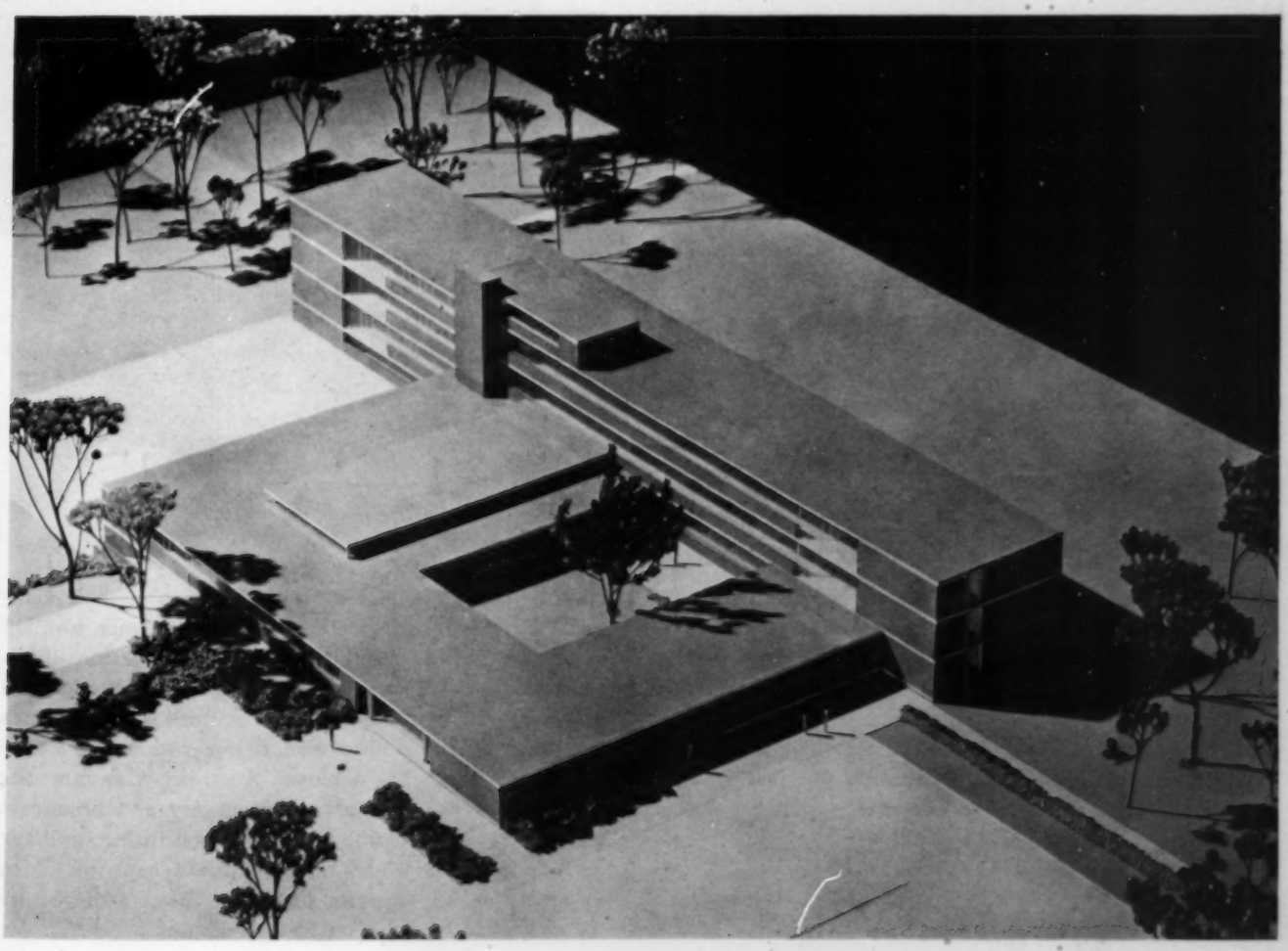






"It was considered very desirable," the architects report, "to avoid the forbidding institutional character so often associated with hospitals, both in the exterior and interior treatment of the building. We have attempted to keep the building as low as possible, to follow the contours of the ground, to keep all traffic to and from the building on the north side of the building away from the patient areas. This made it possible and desirable to have the large window areas in the patients' rooms. The entrance court, with the porch along the whole side of the lobby, provides a comfortable and gracious automobile entrance; and the view through to the garden gives a quality of informality to the entrance and lobby. The staff library and conference room and the garden may be used by ambulatory patients and visitors whenever desired. The exterior, except for the glass and the concrete floor slabs, will be of warm brick.

"When this model was built, the plan provided for an out-patient department, with separate entrance, which will not be built at the present time, and which therefore does not show on the plan. The model also shows only one penthouse, and there will now be two, as it was decided that two elevators were necessary. The penthouse shown will contain, besides elevator machine room, two stair exits to the roof, and a small apartment for the director of nurses." Present plans do not call for a nurses' home, but a nurses' quarters and training school is shown on the site plan, in the extensive rear yard

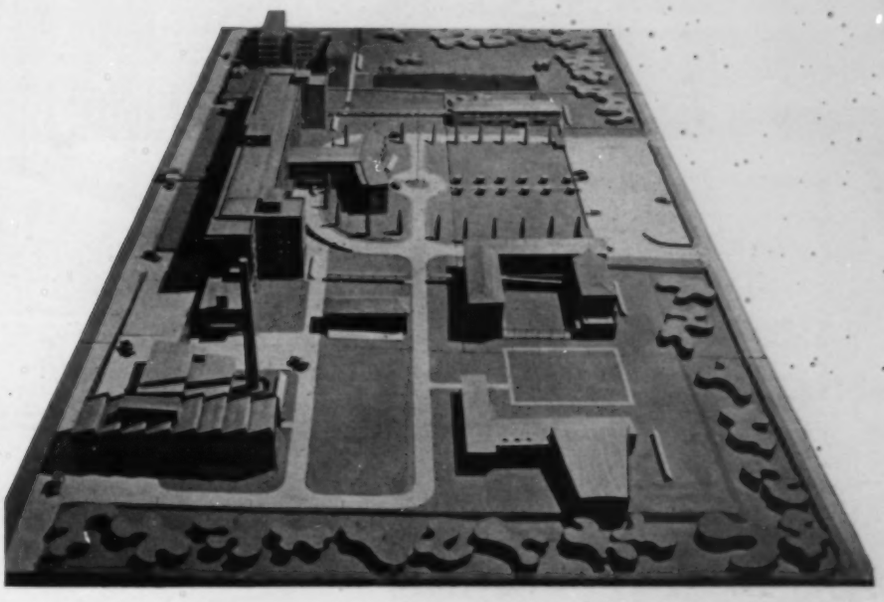


HEIDELBERG MILITARY HOSPITAL

Melbourne, Australia

BUILT during Australia's most critical period of the war, the Heidelberg Military Hospital in Melbourne bears witness to effective long-term planning which refused to be stampeded. It was erected in purposeful stages, catering to a growing stream of hospital ships, trains and air ambulances, but also to a master plan which called for neither just a hospital nor just a military hospital, but for an all-embracing center for the restoration of war casualties whatever they might be, and by every possible means.

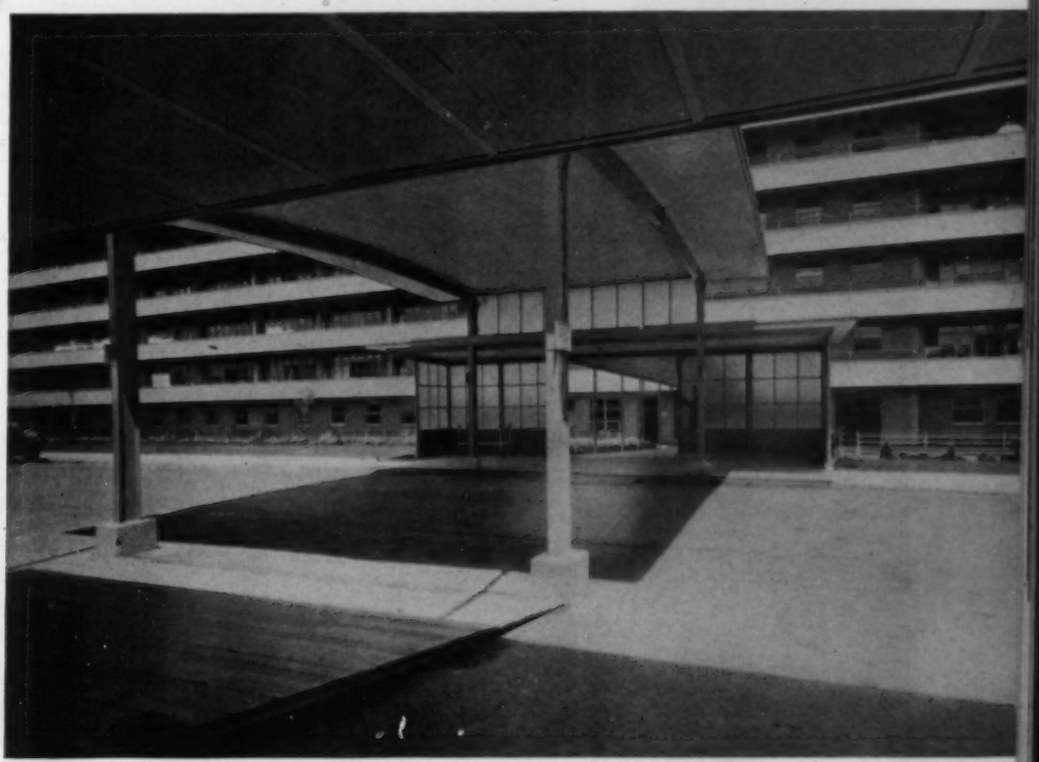
As the war progressed, "Heidelberg" became the headquarters of not only the Army Medical Corps, Nursing Service and Red Cross, but also of the amenities, educational service, vocational guidance and all associated aids to rehabilitation. Its population of between four and five thousand is that of the home town of many of its inhabitants. It occupies some 65 acres fringing one of Melbourne's newer residential areas. In a few years it has achieved Australia-wide fame for features as varied as advanced surgery and broadcast concerts. It has become a national institution, and the architect's scale model of it (a photograph of which appears on the opposite page) has been acquired by the National Museum at Canberra.

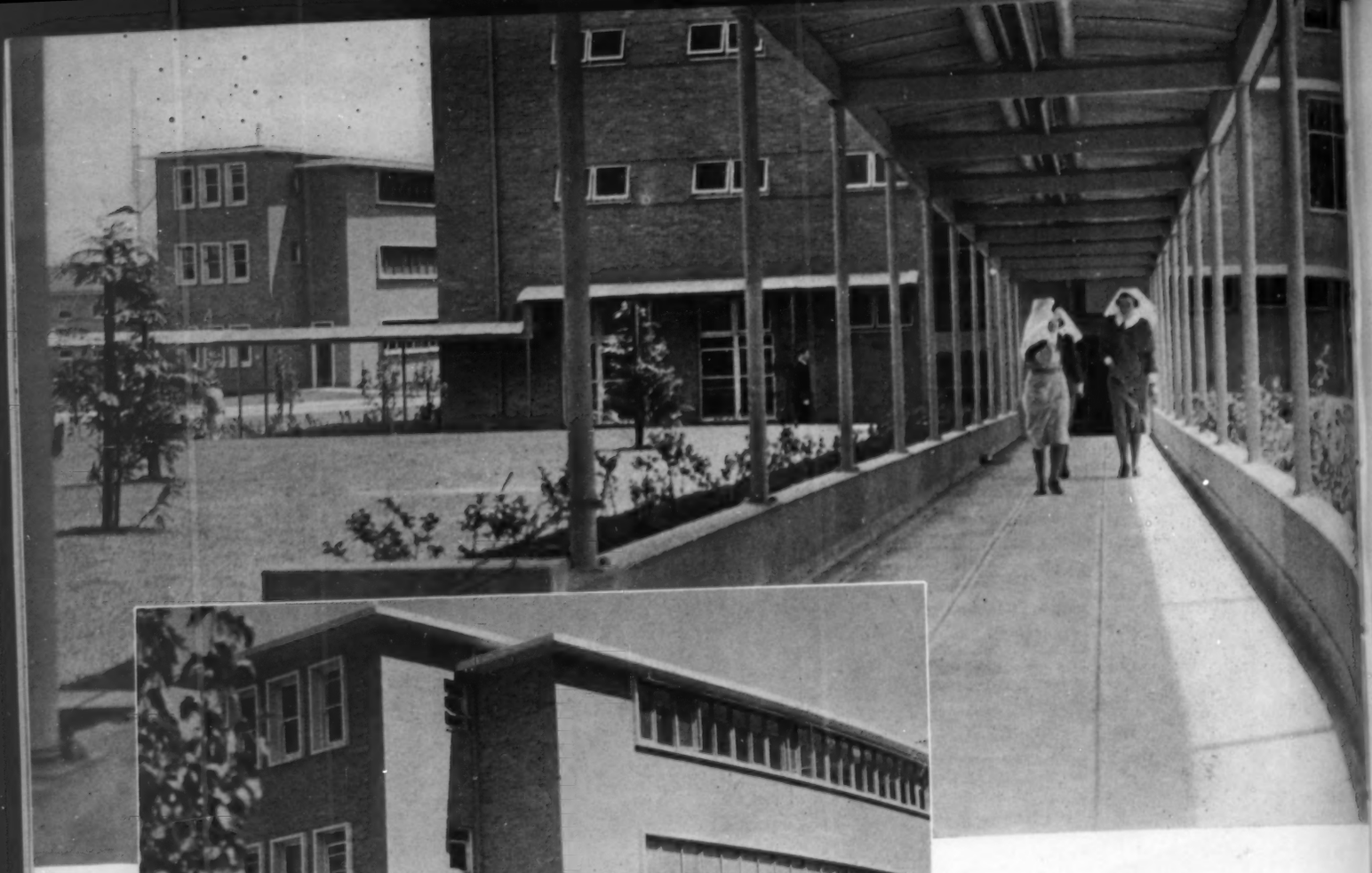


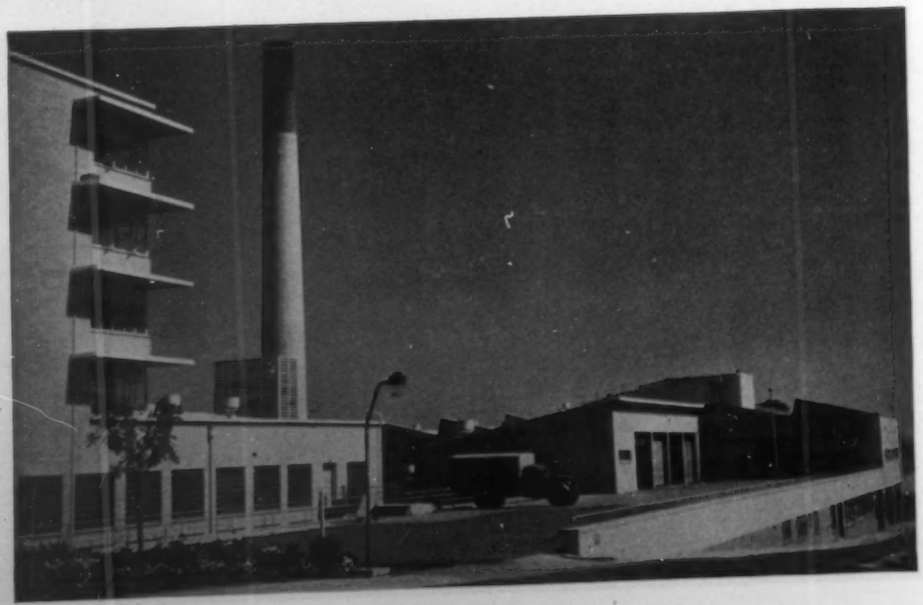
The model is viewed from the west, with the main approach (from the south) to the right. The point where the covered way spans the service road (below) is the central control for the clearance of ambulance convoys. It has direct covered access to the pavilions, the main hall of the Acute Block and thence to operating section. Above the first floor the Acute Block (left) is in effect all window. The wall is a prefabricated grid of concrete frames. Panels are normally glazed but may be solid or void, door, window, ventilator or wall as required. This system proved both economical and effective

Leighton Irwin & Company,

Architects and Engineers



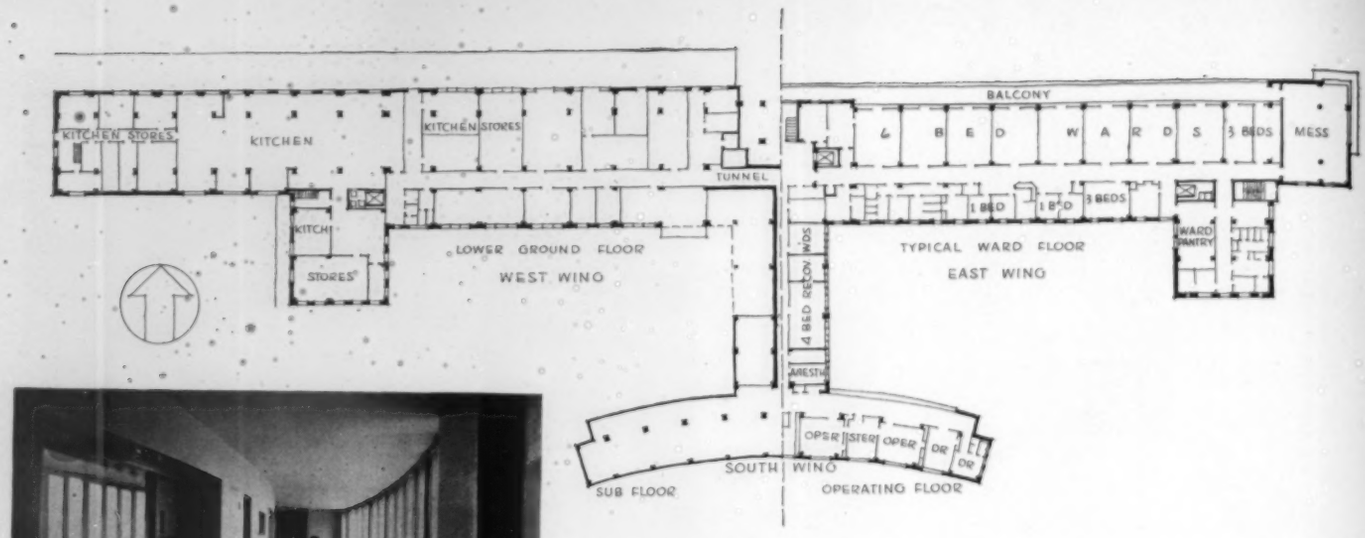




Buildings of the permanent section are linked by commodious covered ways, running through gardens. Gardening is one of the staple occupations of the Occupational Therapy Department; variations of its occupation with time and circumstances being essential, the new gardens which the architects are now providing are being prefabricated in demountable panels. The South Wing (center photograph) expresses in its architectural character something of the delicate precision of its operating theaters and research laboratories. Its gently curving wall, externally, facilitates and enhances the main approach, and, internally, adds grace without interrupting supervision in the corridor. The Laundry and Boiler House (left) makes use of contours to bring a service road to the second floor, and permit a gravity system for both fuel and laundry operations

The Nurses' Home (right) also uses the system of prefabricated concrete frame, which lends itself to a variety of treatments — solid wall, windows, doors, ventilator or void

The problem of food distribution was not that of a civilian hospital in that each floor is run as an army unit with its own mess. The messes are located at the ends of each floor of the main building (left); this location is convenient to elevators, and electrically heated food trolleys can reach any mess from the main kitchen in a matter of minutes



(Left) Curving corridor of operating theater section is reported as a "sterile air lock between the theater section and adjoining quarters." (Below) A view of the main kitchen, which serves about 5,000 meals a day. The kitchen is at ground level at one end of the main building, basement level with respect to building traffic, and convenient to elevators, which, as the plan above shows, are at ends of the wings

SYMPHONIZED CHILDREN'S STORE

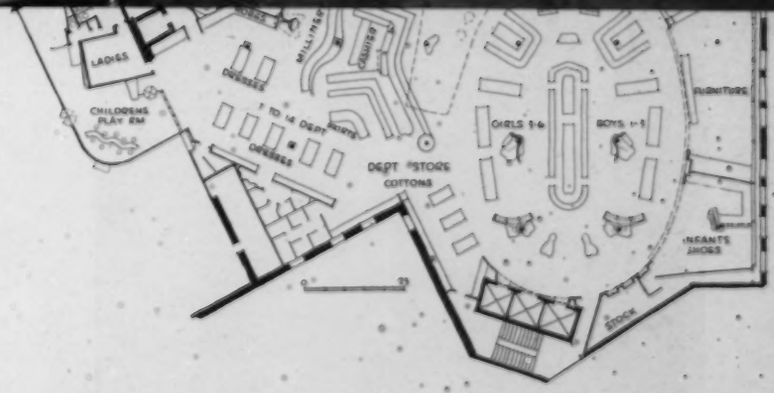
MORRIS LAPIDUS

ARCHITECT

HARMONIZING motives of Jack and the Beanstalk, Caesar's Commentaries and Basin Street, the architect in his handling of the Martin's Children's Store in Brooklyn unifies considerable diversity and creates a symphonic progression from layettes to 'teen-age date dresses. From another metaphoric angle, the effect is that of a Mother-Goose to sub-Stork-Club bazaar, in which the prospective customer is led along, not by clamorous barkers and tub-thumping, but by subtle changes of color and light and compelling features glimpsed ahead.

Immediately confronting visitors off the elevator are two mosaic columns, depicting climactic moments in nursery lore. Original owner skepticism as to their merchandising value has given away to unqualified satisfaction over their effectiveness

In addition to figures on mosaic columns, mural figures over the elevators are by Rowena Reed. Linoleum cut-outs were made and adhered to plaster wall surface. Column wing partitions are of hardboard, inscribed with nursery rhymster notions as to the differing composition of little girls and little boys



as mood and circulation starters. Designed by Rowena Reed of Pratt Institute, they have been given the same meticulous and reverent execution by the De Paoli artists as applied by them to the most exalted themes.

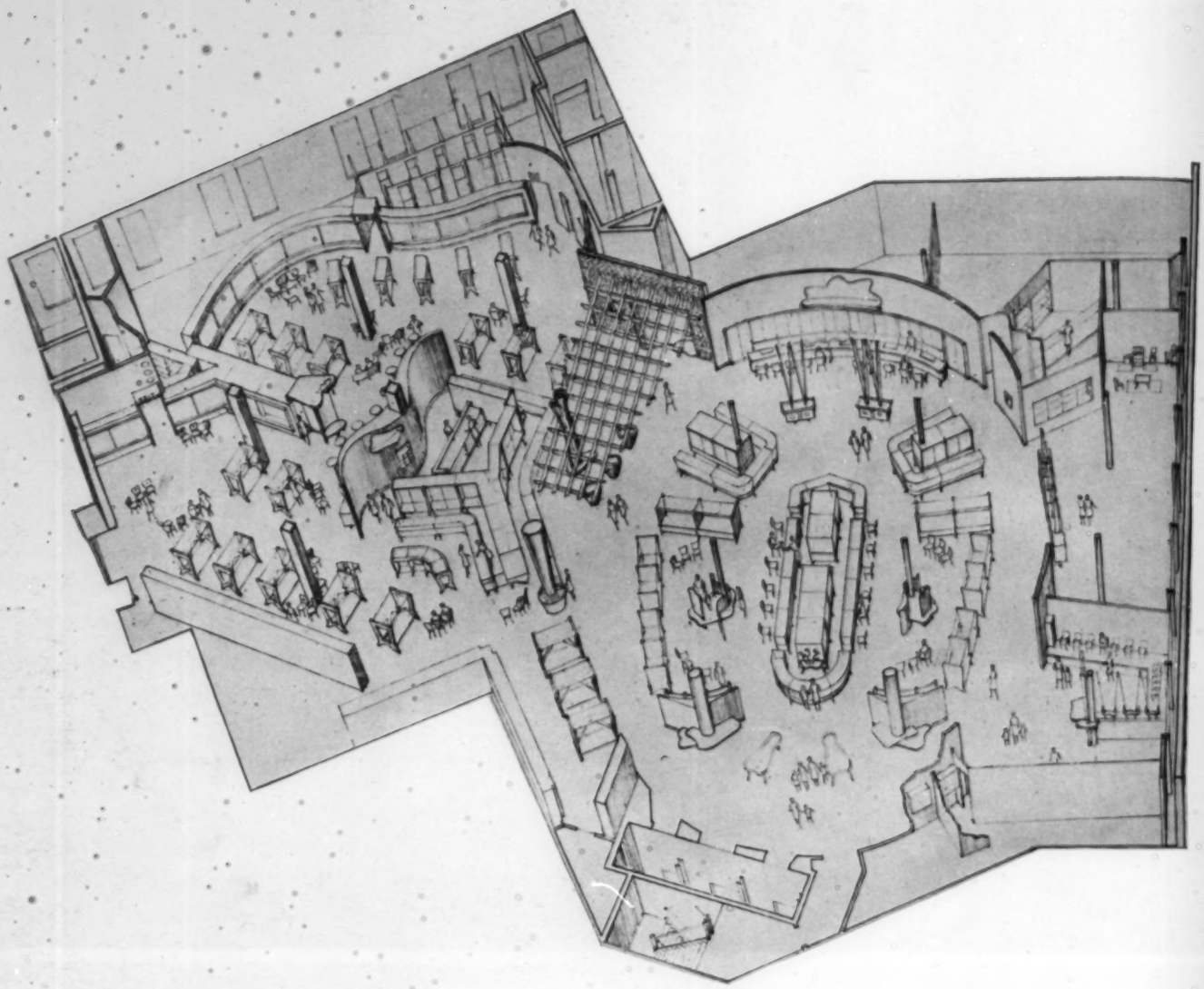
From this arresting opening, the customer is enticed from one department to the next, each with its own distinct and appropriate character but always a harmonious and progressive part of the whole. The pale yellow of walls and ceiling in the infants' wear department gives way gradually with rise of the age spiral to dark green for the 'teen-age section. The young sophisticate regards the intermediate smaller-fry departments not as demeaning encroachments but as logical movements toward the climax of her own dignified and especial salon.

Rounding off the angularities of the existing building and using the space between as convenient stock rooms; exploiting the numerous structural columns as interest compellers, sheathing some with mirrors, others with mosaic, plaster and tree bark; the architect has achieved a store in which circulation is irresistible, in which there is departmentalization without segregation, variety without clutter.

Far left: Young children's wear department, looking toward elevators. Case lighting is cold cathode tubing; glass grids conceal fluorescent fixtures; direct spots and floods give high intensity illumination on merchandise. Far left, below: entrance to furniture department; translucent louvers on back wall admit daylight and air, conceal original outside windows. Left: shoe department. Small customers mount platform, to them an entertaining project, which facilitates fitting; stock is handily stored in drawers beneath. Back wall is Marbelia. Below: small children mount platform for suit and coat fitting; adjustment and alteration marking are easier at this level. Children enjoy provision of individualized mirror

Above: In the layette department special comforts are provided for specific customer conditions. The architect also employs here his characteristic device of curvilinear showcases, embracing and containing the customers' interest. Below: Birch battens separate 'teen-age from 7- to 14-years' department

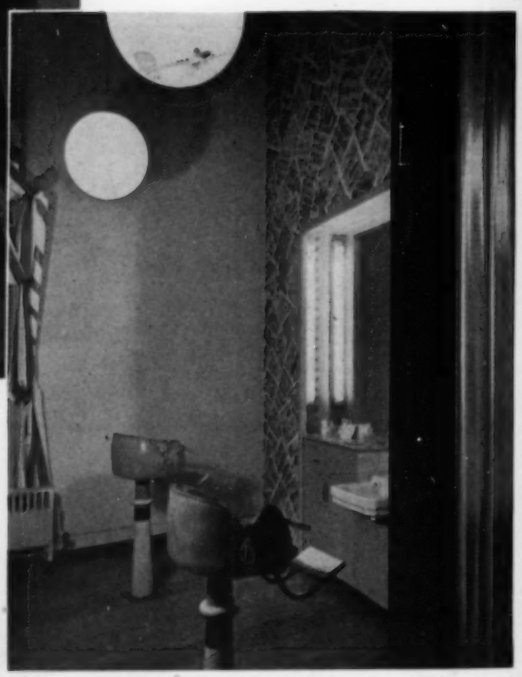
Above: Ribband pillars separate the layette from infants' wear department. Walls and ceilings in this section are a pale yellow. Right: customers pass around the flaring plaster column from the young children's into the department for 7- to 14-year olds. Colors of surrounding walls and ceiling in this area have graduated to light green



Right, above: this mural above the back elevators is the architect's particular pride, his own conception and execution — a slice of 'teen-age stream of consciousness. Figures are photographs much blown up; garments are actual applied fabrics. Below: the architect's symbolism in the 'teen department involves mighty oaks from little acorns and the finished solidarity of brick walls. The three spinning tops deny that giddy whirls and stability are mutually exclusive. The bark is direct from living tree, removed entire by boiling

Far left: millinery display on reverse of birch batten, partition shown also on page 84. Stock cases are of oak, topped with one-inch continuous glass. Left: date dress display case exemplifies the architect's principle of framing merchandise. Back walls and ceiling are dark green plaster

Below: accessible to the right through Playland is the barber shop where comic-section wall paper and snug pocketing in catchers' mitts on ball bat pedestals keep the lambs amenable to shearing



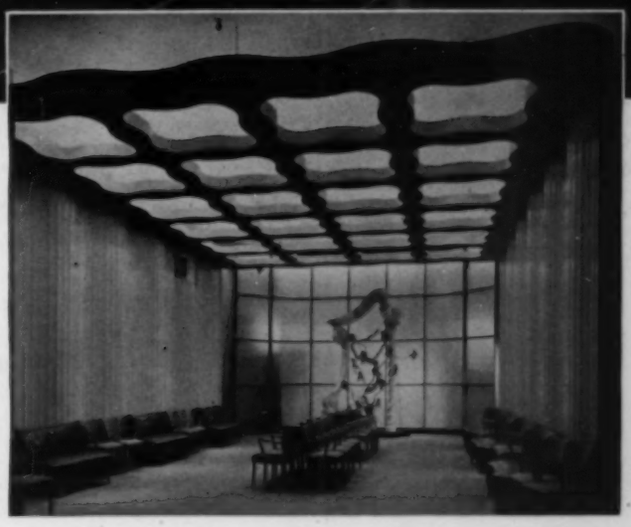
Top: 7–14 year department avenues the customer toward Playland (above) where games and playful distractions are supplemented by light snacks from the refrigerator. A safety feature is supplied beneath Humpty Dumpty

Morris Lapidus, Architect

BAROQUE FOR SHOE SELLING

PRINCIPLES of merchandising ladies' shoes brought first from the architect a modern free-flowing plan, accomplished within an existing structure for this Ansonia Store in New York. The next problem of an appropriate decorative scheme gave some pause. Some variety of "modern" seemed logical for best expressing and complementing the basic free flowing plan. Yet all attempted solutions in this vein proved unsuitable for accomplishing the primary objective of ladies' shoe merchandising. Adopting Baroque as a compromise, the architect declares that it has not only proved a highly successful answer to the merchandising problem but does sufficient justice in expression of his plan. Cold cathode lighting behind the display cases (photo at left) carries the free-flow effect almost to the point of aerial flotation.

GOTTSCHO-SCHLEISNER Photos

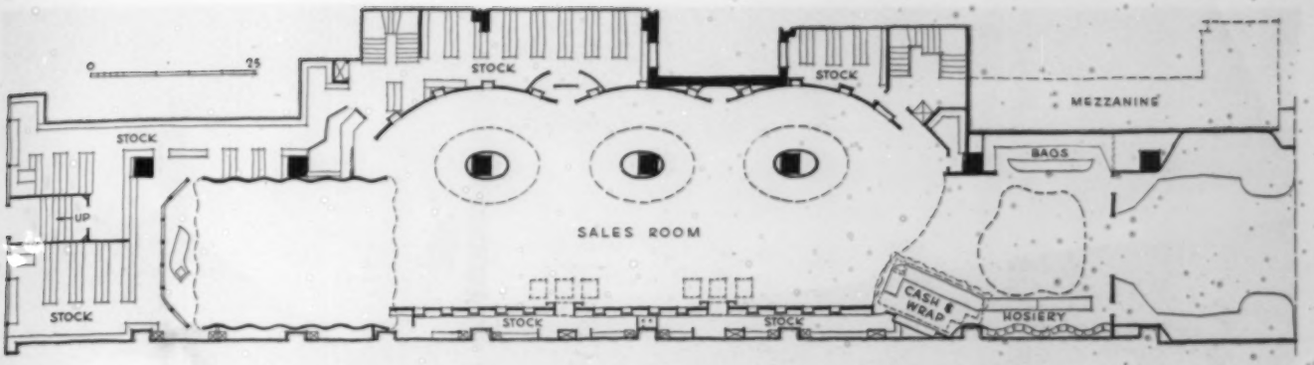


Above: Free-flowing seating arrangement follows naturally the Baroque column treatment. Right: the architect employs here a favorite device, a refinement of the moth-to-flame attraction: compulsive planes of light draw customer circulation toward the rear of the store

One of the primary problems before the architect was to provide ample stock spaces, close and convenient to the hand but in no way obtrusively

evident to the customer's eye. His solution was to utilize the space created between the outer walls and the selling area partitions, with stock thus but a few steps away in any direction from sales points, through frequent doorway access.

In his fixed seating arrangement the architect has eliminated the considerable problem of cleaning around chair legs by using a continuous bulkhead from seat to floor level. Direct flood and spotlights give high intensity of illumination on the selling plane



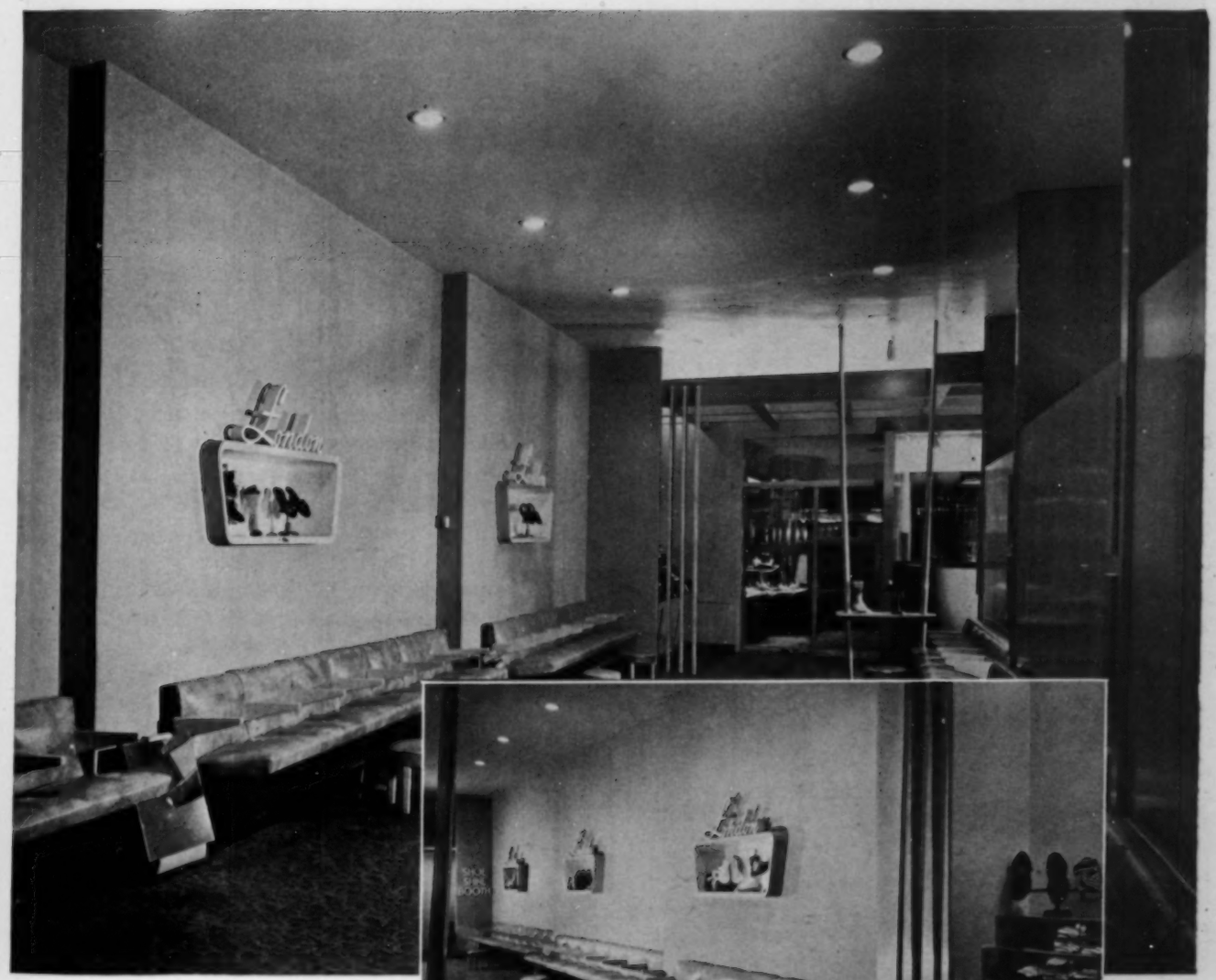
Right: original structural columns at irregular intervals were symmetrically ovalled around with plaster, papered with highly lacquered Marbelia. Below: spacious ante-room orients the customer entering from street and settles her shopping mood

GOTTSCHO-SCHLEISNER Photos

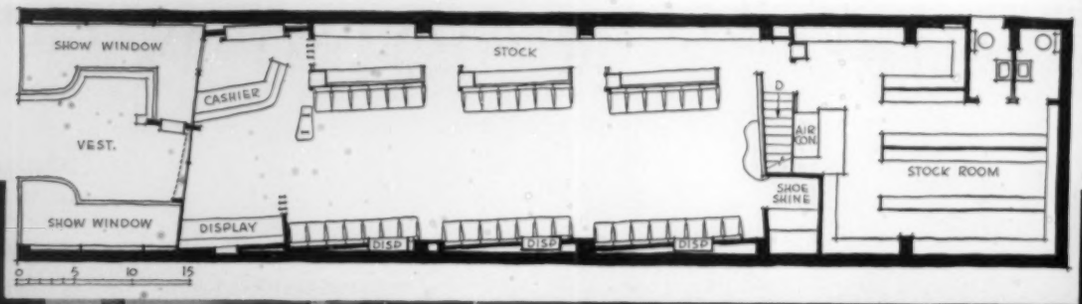
SHOWPLACE FOR CHARACTER SHOES

Morris Lapidus, Architect

CONSIDERATION for niceties of shoe merchandizing, this time for men, again determined the architect's approach and handling in this New York store for London Character. In a setting somewhat more restrained than the Ansonia Baroque (see pages 89 to 91), he has utilized to good effect his devices of seating with cantilevered arms and continuous bulkhead beneath, individualized display cases, and direct floods and spots onto vital selling levels. The plan likewise provides convenient stock access.



Left: Street entrance and ante-room; grid contains indirect lighting. Above and right: Sales area has burlap fabric walls to right of entrance, oak paneling to left



Plan (top) shows convenient stock space and generous ante-room for customer orientation and mood settling. Photos above and left show this architect's characteristic device of light to induce customer circulation toward the rear of the store; in this case he exploits a glass stairway screen for the purpose. Bulkheads beneath the seats have linoleum facing

MANAGEMENT-LABOR COOPERATION IN TRAINING APPRENTICES

By William F. Patterson

Director, Apprentice-Training Service

U. S. Department of Labor

IN OUR highly industrialized economy the training of apprentices is at all times of vital importance, as apprenticeship is the only method recognized by management and labor through which competent bricklayers, electricians, toolmakers and the other skilled workers whom we need are developed.

At this time, however, when we are setting our sights for a record volume of civilian goods, apprenticeship is of greater importance than at any time in our history. As apprentices are our future craftsmen, we must employ and train enough apprentices now so that we will have the skilled work force required for the job ahead.

Our number one national production project is construction, with the nation looking forward to a 10- to 12-year building program on a high level. The construction industry is fortunate in being in a strong position for the training of apprentices to help accomplish this task, and to help expedite other needed building and the backlog of alterations, maintenance and repair work that has piled up during the war years.

The many veterans seeking apprentice training in the building trades are giving the construction industry a unique opportunity to improve its public relations. These former servicemen not only have an acute housing problem, but they also have employment and training problems. By giving veterans employment and training in apprenticeship, the construction industry can not only bolster the skilled work force it needs, but can repay veterans, in a most practical way, for their service in defense of our country.

News of what contractor and labor organizations are doing for these men will go back to their relatives, friends and veterans' organizations.

Place of the Architect in Apprenticeship

Architects can make a valuable contribution to our national economy in this vital undertaking. No one knows better than the architect the need of craftsmen to execute his plans. He knows a handyman cannot be substituted for the craftsman in the quality construction designed by the architect. In fact, his work cannot be accomplished and his profession will suffer if we do not have enough craftsmen.

The architect is eminently qualified to participate actively in apprenticeship. As the top professional man, but neither employer nor employee in construction, he is well fitted to serve as chairman of a joint apprenticeship committee, also to serve on a State Apprenticeship Council.

He and his organization can use their influence with contractors to encourage adequate training, and they

A 24-year-old veteran, Charles O. Edwards, back at his lathe as an apprentice in granite working. His instructor is Horace H. Eaves, manager, Elberton Granite Turning Works, Elberton, Ga.

After a little interruption of three and a half years, spent in the Army Air Force, Melvin T. Brody is back learning the carpentry trade, atop a new garage in Atlanta. R. W. Linsey, foreman

also can use their influence to have contractors participate in establishing new programs where needed. Architects can offer technical assistance in providing lectures to apprentices in the school phase of the training, and they can inspire apprentices with the value and dignity of craftsmanship.

In their public relations work, architects can do a great service to the construction industry and to the nation by emphasizing that sound building requires craftsmen, and that craftsmen are developed only through apprenticeship.

Joint Participation in Apprenticeship

The effective cooperation which exists between management and labor organizations has been invaluable in building up a strong position for the development of craftsmen in the construction industry. At the top level is the General Committee on Apprenticeship for the Construction Industry, composed of an equal number of representatives of national contractor organizations and labor unions, which is the policy-making body for the construction apprenticeship program.

This committee and the Apprentice-Training Service have assisted national joint committees representing various crafts in setting up national apprenticeship standards for 10 trades: plumbing; painting, decorating and paperhanging; steamfitting; electrical work; carpentry; crafts of the plastering industry (plastering, casting, sculpturing and model making); cement finishing; bricklaying; stained glass work; and roofing. These national standards are patterns for the establishment of local joint apprenticeship programs. They are flexible enough to permit adjustment of wages, the number of apprentices who may be hired in proportion to employed journeymen, and other matters for different communities.

The General Committee has been very active this year. After meeting with officers of the Building Trades Department of the American Federation of Labor, it was designated informally as the agency for handling of apprentice training for the A. F. of L. Building Trades Department.

The General Committee also met twice this year with Wilson W. Wyatt, National Housing Expeditor, and representatives of ATS to discuss ways and means to help provide the skilled labor needed to speed up the Veterans Emergency Housing Program. The General Committee agreed that, based on local needs, the apprentice wage structure can be adjusted, the proper number of apprentices can be determined, apprentices with unusual aptitudes can be advanced more rapidly, and credit can be and is given for previous work experience to shorten the training period.

That this is being done is evidenced by a study made by ATS and reports from various areas. The study, made last May, of more than 1,000 former servicemen who were selected at random and who have been employed in the building trades since V-J Day, shows that about 28 per cent of this group were granted credit for previous experience, and that one out of every five was given that credit for experience gained while in the armed forces. As new registrations of apprentices show that more than 80 per cent are veterans, it may be assumed that the percentage of all recently employed apprentices who are being given this credit is about the same proportion as that covered by the study.

More Openings for Apprentices

Reports show that the ratios of apprentices who may be hired in proportion to the number of employed journeymen are being liberalized to meet current needs in many areas. The Building Trades Council of Duluth, Minnesota, has changed its prewar ratio of 1 to 10 to 1 to 5, and in some of the building trades in Duluth the ratio has been lowered to 1 to 3. In Wichita, Kansas, the ratio for plumbers has been lowered from 1 to 5 to 1 to 3 by the joint apprenticeship committee for the trade representing Local 171 of the United Association of Journeymen Plumbers and Steamfitters, A. F. of L., and the Wichita Master Plumbers Association.

Another project to hire more apprentices is showing good results in Minneapolis and St. Paul. About 30 apprentices are being hired in the carpentry trade every two weeks in these cities, and the Twin Cities Joint Apprenticeship Committee for the carpentry trade announced it will continue to hire apprentices at this rate

"All of the labor unions, cooperating with the Associated General Contractors and other employers of building-trades labor and the U. S. Department of Labor, are extending themselves in every way possible to train these boys. . . . My own organization since V-J Day has registered nine thousand apprentices, 60 per cent of whom are returned veterans. That is an example of how far labor is going . . . to bring the supply somewhere near equal to the demand."

Richard Gray, Building and Construction Trades Department, American Federation of Labor

"Management heartily agrees on the need for an enlarged apprentice training program . . . thousands of apprentices in 19 crafts or trades are undergoing training under local committees administered jointly by management and labor. About 70 per cent of these apprentices are veterans. The association also has been assisting in the development of national standards and training programs for apprentices."

H. E. Foreman, Managing Director, Associated General Contractors of America

Quotations from a recent radio forum conducted by the U. S. Chamber of Commerce on the NBC network

until it has 400, which the committee estimated will be sufficient for the immediate future. This committee is composed of representatives of the Twin Cities Carpenters District Council and the St. Paul and Minneapolis Builders Division, Associated General Contractors of Minnesota.

Under the Lincoln, Nebraska, program for bricklayers and the Wichita program for plumbers, apprentices are being given special opportunities to complete their term of training in less time than usually required. In Lincoln, the joint committee composed of representatives of the Associated General Contractors of Nebraska and Local 2 of the Bricklayers Union and the Vocational Education Department of Lincoln High School have established a project which enables apprentices to demonstrate skills they already have acquired in the trade and to learn new skills. In a part of the school set aside for that purpose they lay brick and learn the basic theory of their craft. This concentrated work and training, given for a period of eight weeks, make it possible for the most proficient to earn up to 18 months' credit toward the completion of their term of apprenticeship.

The Wichita project for plumbers is similar to that in Lincoln, and is being conducted by the joint apprenticeship committee in cooperation with the Vocational Education authorities. The committee did not specify the exact amount of credit which may be given, but stated that apprentices with unusual aptitudes will be moved ahead so they can finish their training in less than five years, the usual term.

These various enterprises and others like them in other areas are concrete examples of what the building trades unions, together with contractors and the vocational schools, are accomplishing to develop more skilled workers needed locally. There is, however, no visible trend to reduce the terms of apprenticeship which have been found necessary for the development of all-around craftsmen. The undertakings referred to are special measures taken to speed up development of the skilled work force in localities where sufficient building craftsmen are lacking.

Better Public Relations Created

This joint participation on the part of labor unions and contractor organizations in advancing the cause of apprenticeship is voluntary, and is a splendid example of management-labor cooperation in a vital phase of industry. It has not only been a major factor in the establishment of a rapidly increasing number of local joint apprenticeship programs, to which I shall refer later, but it has created better public relations for contractors and unions in the construction industry.

Joint apprenticeship programs impress the public with the social responsibility accepted by contractor and labor organizations in working together to provide

A SeaBee electrician, F. S. Porham, continues his wartime trade as an electrical apprentice, under W. C. Williams, foreman. His war experience will count on his apprenticeship training time

young men with the opportunity to learn a skilled trade and in developing the craftsmen needed in the community and the nation.

Newspapers, keenly aware of the necessity of good relations between employers and employees, are giving valuable publicity to the joint apprenticeship programs being set up in their communities and to other activities of local joint apprenticeship committees, like the hiring

This purple heart veteran, R. A. Bowman, before the war was a textile worker. Back home again he is taking up welding, as an apprentice in steamfitting, under J. W. Melton, journeyman

of more apprentices, graduation of apprentices, and the employment of veterans in apprenticeship. ATS has hundreds of newspaper and magazine clippings to attest to this publicizing of local joint apprenticeship programs and activities of local joint apprenticeship committees.

Local Joint Committees Essential

Valuable as it is, building better public relations is but one necessary undertaking in apprenticeship. More important is the setting up of local joint apprenticeship committees, representative of contractor and labor organizations, in every community, and the hiring of the number of apprentices needed. These local joint committees are the operating units, the heart of building trades apprenticeship.

They establish and administer local joint apprenticeship programs for one or more trades in an area or plant. Field representatives of state apprenticeship agencies and of ATS lend technical assistance in this work. The local apprenticeship programs contain provisions for the work processes to be learned, the payment of wages, the awarding of a certificate on the completion of the term of apprenticeship, that the apprentice be indentured under a written agreement, and other requisites for the protection of apprentice and employer.

Recognition of all joint apprenticeship committees in the building trades as "training institutions" was made official by General Omar Bradley, Administrator of Veterans Affairs, on February 2 in a letter to Marion Hedges, Chairman of the General Committee on Apprenticeship for the Construction Industry. The letter states, in part:

"Admittedly, such joint committees are not actually giving education in the strict sense of the term since the education is being provided by business establishments. However, it may be assumed for the time being that the appropriate agencies of the respective states will have determined in advance that each joint committee which it approves is actually performing the functions for which it was established in an efficient manner and is arranging for training in establishments which are adequately equipped and staffed to provide a complete and well-rounded course of instruction. On this assumption, I have determined that Joint Apprenticeship Committees may be recognized as qualified and equipped to provide suitable training to veterans under Public 346, 78th Congress, in those states in which such recognition has been granted."

Under the G. I. Bill veterans who are accepted for employment and apprentice training receive in addition to their wages a monthly subsistence allowance. This allowance ranges up to $65 a month for a veteran without dependents and $90 a month for one with one or more dependents. At no time, however, may the veteran-apprentice receive more money in wages and payments from the government than the journeyman in the trade. If necessary, the government payment is reduced as the apprentice's wages are increased.*

Large Increases Since V-J Day

The activities and accomplishments which I have described give only a partial picture of recent developments and of the cooperation of management and labor in apprenticeship in the building trades. A significant increase was noted since V-J Day in the number of establishments covered by registered apprenticeship programs, and in the number of programs.

Between V-J Day and the end of May, 1946, the number of establishments with approved programs was practically doubled. The number increased during that period from 16,780 to 32,303, according to incomplete reports.

The number of local apprenticeship programs rose during those nine and one-half months from 954 to 1,561, a gain of almost 64 per cent. The General Committee agreed there should be 5,000 such local programs to produce the craftsmen needed in the construction industry and pledged its support in their organization. Directives from its members have resulted in the publicizing of this fact in management and labor publica-

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* *A pamphlet issued this year, "Setting up an Apprenticeship Program, a Guide to Employers in Training Veterans for the Skilled Trades," explains provisions of the G. I. Bill and contains other information to assist employers and their employees in establishing apprenticeship programs. Copies may be had from the Apprentice-Training Service, U. S. Department of Labor, Washington 25, D. C.*

tions, and have been instrumental in bringing about the increase referred to.

The cumulative total of apprenticeship programs in the building trades recorded every two months since V-J Day in 1945 and every month in 1946 are:

September, October, 1945	995
November, December, 1945	1,118
January, 1946	1,210
February, 1946	1,265
March, 1946	1,352
April, 1946	1,457
May, 1946	1,561

Employment of apprentices is keeping pace with the increase in apprenticeship programs. Incomplete reports received by ATS from more than 1,500 areas throughout the country show that there were on active file 42,392 apprentices in the building trades at the end of May. The gain in May alone represents an increase of 20 per cent over the total number previously employed.

While the average term of apprenticeship is four years, the additional apprentices being hired will not only augment the skilled work force four years from now, but will also help speed up present construction, maintenance and repair work. This follows because an apprentice is a worker who produces as soon as he is hired and whose productivity increases as he learns new skills. But quality training must be adhered to so that the apprentice may become a competent craftsman as well as becoming proficient at the jobs he performs while in training.

Smaller Communities Lagging

Even more apprentices could be trained now if more smaller localities carried their share of the load. Too many small communities are doing no apprentice training and are depending on the big cities to develop skilled workers. Small communities which have established apprenticeship programs also often do not have the facilities to provide the necessary related classroom instruction for apprentices in the various trades. This is posing a real problem, and to solve it the substitution of itinerant instructors or correspondence courses has been suggested.

More Local Programs Needed Now

Apathy on the part of some local contractor-labor groups in regard to apprenticeship is proving an obstacle. They apparently are waiting until we have material flowing for the full amount of projected building. If they set up the necessary machinery — local joint apprenticeship programs — now, they will be in a position to employ and hire apprentices when sufficient materials arrive.

Another obstacle is the lack of enough field representatives of Apprentice-Training Service and State Apprenticeship Councils to give needed impetus to get apprenticeship programs organized, started and maintained. Because of the national housing shortage, ATS has adjusted its own program to give increased assistance in expanding apprenticeship to the building trades. To accomplish this task, ATS field representatives are giving priority for technical help to the building trades over all others in organizing new local programs.

Then there are some contractors not concerned about training apprentices because they have no assurance they will have their services after they have become journeymen. This group may be interested in an article in the January, 1946, issue of the *Ceramic Tile Journal*, a management publication. The writer of this article stated:

"At a recent meeting of tile contractors the following remark was made, 'Why bother with developing apprentices when you are not sure you can hold them after they have completed their indentured period? You are only making tilesetters for some other tile contractor.' "

With irrefutable logic the writer then pointed out that an apprentice cannot be forced to work for anyone after he has learned his trade, and that the training of apprentices should be regarded by contractors as their responsibility to increase the number of skilled workers needed in their industry. He also stated:

"Without an adequate and available supply of skilled mechanics there can be no profit dollars to count. . . . The tile contractors who hope to be in business ten or twenty years from now had better give serious consideration to this part (apprenticeship) of the tile contracting business."

It is highly important that the local facts on construction — the volume that may be expected, the number of craftsmen that can be employed and apprentices that can be hired — are available to unions and contractors.

How to lay brick properly in a soaking pit floor is shown to apprentice Harry Floyd by H. D. Tyson, in a plant of the Tennessee Coal, Iron and Railroad Co. (U. S. Steel) in Birmingham, Ala.

These facts are necessary to keep the training of apprentices in proportionate balance in all the building trades. Only by maintaining this balance can there be maximum employment for the different craftsmen engaged in construction.

This fact-finding project is one of the responsibilities of local joint apprenticeship committees and one in which ATS is available for assistance.

The tradition of craftsmanship is here being carried on by a father-and-son team. Journeyman plumber John E. Grove of Washington, D. C., shows John G. Grove how to thread a pipe

Leaders of the American Federation of Labor building trades unions, after making their own studies on national and local levels, have been outspoken in saying that we may experience a shortage of skilled workers and that more apprentices should be trained.

At present there are not enough carpenters and bricklayers in some areas. In the June, 1946, issue of *The Carpenter*, William L. Hutcheson, General President of the United Brotherhood of Carpenters and Joiners, stated:

"Not the least of the problems confronting the building trades today is apprenticeship. . . . Owing to the war years during which virtually all young men were drafted into the armed forces at the time they would normally begin taking apprentice training, a serious shortage of mechanics has developed in our craft. . . . It (the 25th General Convention of the Brotherhood, held this year) recommended that all local unions adopt a set of apprenticeship standards and a system for training apprentices."

Shortage of Electricians Feared

While there is no serious shortage of electricians now, an article in the September, 1945, issue of the *Journal of Electrical Workers and Operators* stated: "The trade will be short about 35,000 journeymen when conversion to peace comes," and likewise called attention to the necessity of training apprentices.

The December 7, 1945, issue of *The Labor Union*, a weekly A. F. of L. paper, calls attention to the shortage of carpenters and bricklayers in the Chicago area. I quote from an article in this issue as follows:

"An evil born of the great depression of the 1930's has come home to roost in the Chicago area where it is impossible to meet demands for certain types of skilled labor because over a period of years no workers were trained in those particular skills. This is especially true of bricklayers and carpenters." This article pointed to one building project where 20 bricklayers were trying to do a job which normally would require 80 bricklayers.

With a shortage of craftsmen already existing in some building trades and because of the record construction program that has been projected, we have every reason to believe that the apprentices being hired and the journeymen now in the trades are assured of reasonably continuous employment for years to come.

The Bureau of Labor Statistics, U. S. Department of Labor, estimates that an average of 1,490,000 workers will be required in 1946 to handle all types of new construction, including the emergency housing program. About 1,890,000 will be needed at the peak, probably September. As something more than half these workers must be skilled, we will need about 980,000 craftsmen on the construction site by September.

In 1949 and 1950 about 2,840,000 site workers will be needed for new construction, according to BLS forecasts, about half of them skilled.

In addition, it has been estimated that there will be employment each year for an average of about one million workers on maintenance work and minor repairs, of whom about two-thirds, or perhaps 650,000 must be skilled.

Thus it can be seen that the skilled work force required for new construction, maintenance and repair by September 1946 is a minimum of about 1,625,000 workers, and in 1949 and 1950, something over 2,000,000.

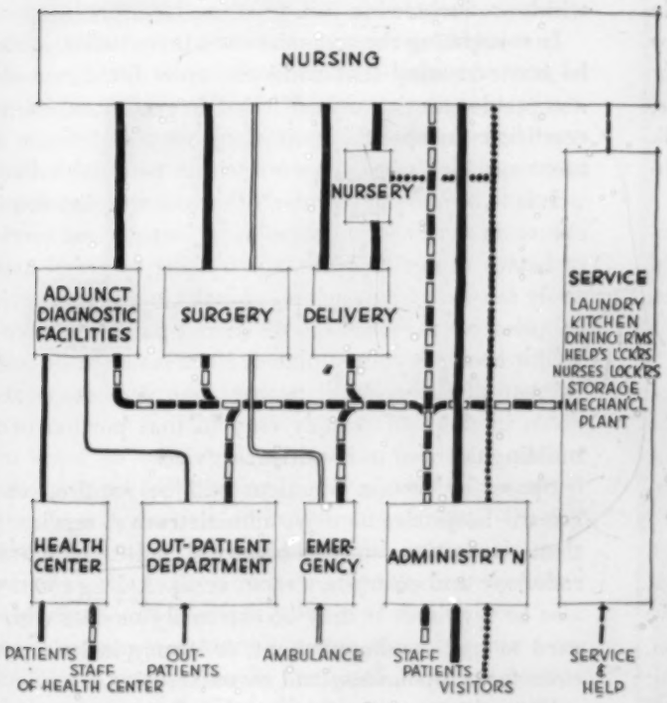
These figures and the fact that we are facing a shortage of skilled workers in the building trades, mean that a big job must be done in apprenticeship. This task requires the cooperation of all groups. Contractor and labor organizations have the responsibility of setting up and maintaining local apprenticeship programs, and the hiring and training of apprentices. Apprentice-Training Service and the State Apprenticeship Councils give technical assistance in this work. Vocational Education provides the related classroom instruction given over the term of apprenticeship.

NOTES ON HOSPITAL PLANNING

Architectural Record's

Building Types Study Number 116

Integration of the many individual elements in a hospital into a smoothly functioning building involves a fairly intricate traffic study, for of course traffic is the dominating consideration at this stage. The key flow chart below is diagrammatic only—the various departments are placed according to traffic separation, not according to position on plan. The various departmental charts which follow this general key do frequently suggest position on the plan, and may be read accordingly. These sub-group charts show traffic flows within the department, and connection to traffic streams throughout the building. Only by a department-by-department study can this over-all key chart be translated into plan positions.



Key Flow Chart — Acute General Hospital

HOSPITAL FACILITIES SECTION

U. S. PUBLIC HEALTH SERVICE

Federal Security Agency

IN MANY years of study of hospital planning the Hospital Facilities Section, U. S. Public Health Service, has accumulated a rich store of information, which is freely available to architects, consultants and hospital administrators. Basic recommendations on planning have been graphically presented in two preceding issues of ARCHITECTURAL RECORD, in the series of 81 plans for various elements of the general hospital. The text that follows gives the thinking behind the plans, and the charts indicate the several considerations in integrating elements into a finished hospital plan.

Marshall Shaffer and his staff of hospital architects stand ready to offer advice and concrete suggestions on preliminary plans for specific institutions, and check them for conformance with recognized standards, but obviously the final plans must be individually developed for the given local conditions, the chosen site. Actual planning of each hospital must of necessity remain the function of architects and consultants who know local needs.

This final presentation in the series is a condensation of a book-length manuscript on the general hospital; only highlights are given here. The digest has been made with the thought that the actual plans of various hospital suites and their accompanying equipment lists amount to a graphic summary of recommendations, also that the more elementary parts, important though they are, should not here be required. If, then, the text might seem disconnected in spots, blame it on the urgent necessity to treat more thoroughly the less obvious do's and don't's and wherefore's.

THE HOSPITAL SITE

Orientation and Exposure. The site should be chosen with consideration for proper orientation of the structure so that every patient room will receive sunlight at least during a part of the day, and proper advantage taken of prevailing winds in the interest of natural ventilation.

The most advantageous orientation will vary in different latitudes and in different sections of the country, but normally the areas occupied by patients in the north temperate zone should face the south, southeast or southwest.

An ideal site in northern latitudes would permit the placing of the administrative offices, the out-patient department and the service departments on the northerly and street side of the property, and the nursing areas on the southerly and quiet side of the property facing areas which do not promise future encroachment.

Dimensions. The minimum size of a plot for a multi-story 50-bed hospital probably should not be less than 300 by 300 ft. if adequate provision for expansion is to be made. In any case, the plot chosen should allow for future expansion of at least 100 per cent in building area and still retain attractive grounds and obviate objectionable appearances of overcrowding.

Thought may be given to the possibility of subsequent provision for communicable disease, psychiatry and other special services.

On the other hand, too large a plot results in costly upkeep. Recreation areas are not required for patients of general hospitals, but some provision is necessary for tennis courts and other recreational facilities if nurses or interns are to be housed.

Sufficient space must be available to accommodate the various traffic lines coming to the institution, and ample parking areas provided. Some cities, for instance Los Angeles, require parking space for one automobile for every two patients. The new hospital, if at all possible, should be built at some distance back from the sidewalk line. Within limits, the farther back the building is located, the better.

Topography. Ideally, the building is best located on relatively high ground in order to take advantage of natural drainage. The elevation should not be so great, however, as to be a handicap to ambulant patients who approach on foot.

The plot should be such that it will permit the patient entrances to be close to ground level. A slope toward the rear, so that the natural grade will permit basement service entrances to be at grade level, will be of considerable advantage.

The nature of the adjacent areas should be considered. Location opposite a public park, provided the park is not noisy, is advantageous since it insures against future encroachment of unsightly buildings from that direction.

Landscaping. The psychological effect of attractive grounds on patient welfare, public good will, and staff morale cannot be overestimated.

Water Supply. While the quantity of water used in a hospital will vary within wide limits, an average yearly figure for the amount of water used may be taken as 200 gal. per bed per day. However, the supply should be adequate to furnish twice this amount on a maximum day.

In the event the location is such that a private water supply must be developed, available ground water or other source of water requires complete and careful study. The chemical and bacteriological quality as well as the quantity available must be considered. In this type of installation a supply that will be satisfactory with no treatment is highly desirable. A competent sanitary engineer should be retained to advise on the sanitary features of the installation and the plans approved by the State Health Department. The Public Health Service Drinking Water Standards, the Sanitation Manual for Public Ground Water Supplies, and the Report of the Joint Committee on Rural Water Supply Sanitation are suggested as guides to those concerned with such a development.

THE HOSPITAL BUILDING

The present trend in design is toward a compact, multi-storied plan, since such a structure is less expensive to build, operate and maintain. There are numerous advantages in a single-story plan for the small hospital of less than 100 beds, although local factors may make this impractical. Whatever the plan, provision for future expansion demands thoughtful consideration. The construction of the building should, of course, be as fire resistant as is possible.

As a guide for the allocation of areas to the various functions and services in the hospital, the Hospital Facilities Section has prepared areas allocation charts which are included in full. (See pp. 126, 129, 131.)

In considering the areas shown in these tables, it must be borne in mind that while the areas listed represent acceptable practice and are based on general experience, conditions in specific institutions vary and hence the areas specified may be varied within reasonable limits.

It is to be noted particularly that the area distribution charts do not include provision for out-patient services or health center facilities, these being regarded as entirely separate from the areas for the in-patient services supplied by the hospital. If an out-patient service or health center is contemplated, its areas must be added to that of the hospital proper. The percentage areas given in the charts apply only to that portion of the building devoted to in-patient service.

Space for certain functions will be required in all general hospitals; namely, administrative, service, patient, operating suite, obstetrical suite, laboratory, radiology and emergency room areas. A drug room will also be required. It may be extremely modest with regard to space and equipment, or it may include provisions for compounding and manufacturing.

There is a growing demand for physical therapy departments in all sizes of hospitals and local needs and clinical practices must determine the amount of space and equipment to be devoted to such a unit.

An out-patient department may or may not be indicated, although most hospitals find that sooner or later such services are necessary if they are to fulfill their complete community responsibility. There may or may not be provisions for communicable disease treatment or psychiatry.

A health center containing space for clinics, offices for health officers, sanitary engineers and public health nurses and possibly offices for private physicians and dentists may or may not be included, but is highly desirable in the community hospital to promote coordination of health activities.

Today's trend is to make the hospital the real health center of the community. Because of the many possible variations in the needs of individual communities, and in the individual specialists available for the staff and hence of specialities to be represented, it is difficult to designate exact requirements that would be applicable to more than one specific hospital. Nevertheless, the broad requirements of the average small hospital can be outlined with reasonable definiteness, and these requirements will be discussed in some detail.

Throughout this text attention has been called to the sanitary aspects involved in the construction of a hospital and in hospital equipment. Due consideration should be given these factors in designing the building and specifying equipment. Because of the nature of the institution, the inhabitants of a hospital are, for the most part, in a weakened condition and unusually susceptible to infection. Therefore, every possible safeguard must be incorporated in the design to reduce the possibility of cross-infection.

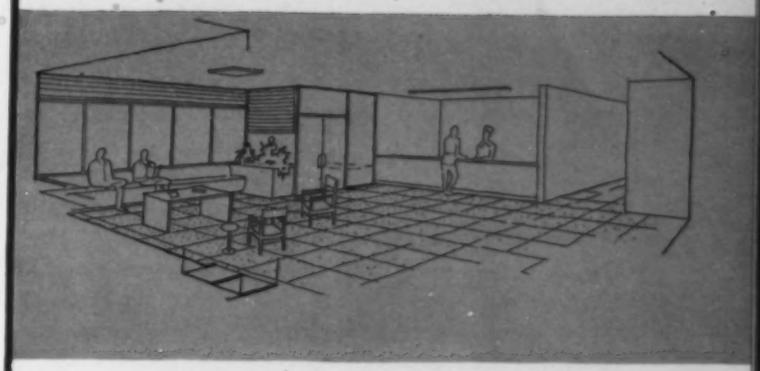
Exterior Traffic. Throughout the planning of the hospital, traffic requires careful thought. Besides the various complicated lines of traffic within the hospital, traffic to and from the hospital must be given consideration.

The latter includes: (1) patients arriving or leaving by automobile or ambulance; (2) patients arriving or leaving on foot; (3) the visiting public who should have adequate parking space; (4) staff members who should have a convenient parking area reserved for their exclusive use, if practicable; (5) controlled ingress and egress of employees with proper facilities for parking; (6) incoming supplies; (7) removal of the dead in an unobtrusive manner; (8) delivery of fuel and removal of refuse and ashes if coal is used; (9) out-patient traffic if an out-patient department or health center is contemplated.

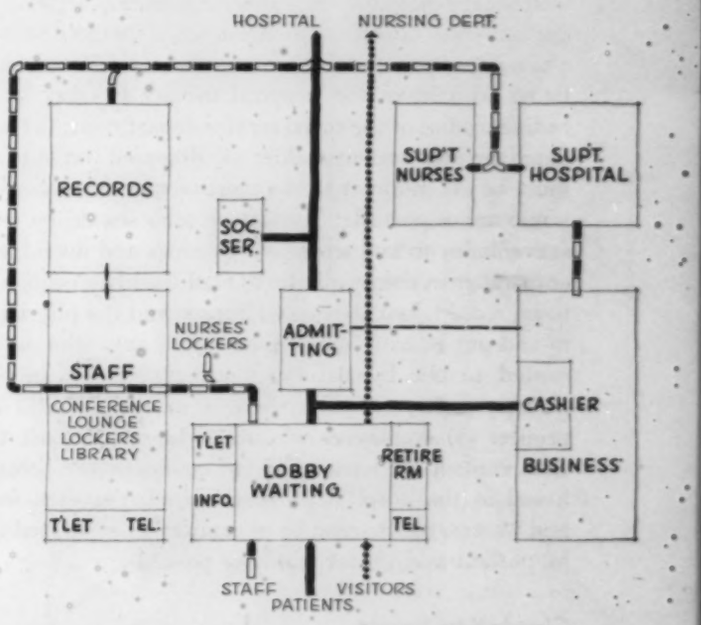
In order to take care of these traffic lines, certain entrances must be provided. The main entrance in most hospitals will receive ambulant in-patients, whether arriving on foot or by car; physicians, providing their reserved parking area is convenient to that entrance and their locker room is properly located; and visitors.

An emergency entrance designed to permit non-ambulatory patients to be received from autos and ambulances, and leading directly to the emergency suite, will be required.

A third entrance with proper facilities for unloading will be needed for supplies and should be in close prox-



Administrative offices are grouped around main lobby and main entrance. Planning goes by sub-groupings. 1. offices; 2. main lobby and waiting room, information desk, cashier's window, public toilets; 3. admitting office and social service office; 4. medical record room and that section of the staff room intended for record study; 5. staff room, locker room, library, and conference or board room



Administration Department Flow Chart

Photo Courtesy of U. S. Public Health Service

imity to storage areas, to elevators and to the kitchen refrigerators. Nonprofessional employees of small hospitals may use this entrance if it is adequately controlled, but in larger hospitals a separate entrance for such employees is generally provided.

Usually a fourth entrance is provided for the removal of bodies. This entrance should be kept locked unless it is also to be used as the employee entrance. There should, however, be only one employee entrance for non-professional employees, and the employee locker rooms as well as the employee time and attendance control system should be convenient to it.

Finally, if there is an out-patient department, a separate entrance must be provided for it. The number of exits or entrances should always be held to a minimum, however, especially if unsupervised.

Interior Traffic. Within the hospital are other complicated traffic lines to consider. Here, some crossing of traffic streams is inevitable. Orderly internal traffic is facilitated by correctly relating facilities and services.

The main traffic streams are: (1) in-coming patients who must proceed from the admitting and social service departments to the patient areas, emergency room, x-ray department, or other services; (2) out-going patients who leave the hospital usually by way of the business office or the social service department; (3) interdepartmental patient traffic; (4) deceased patients who must be taken direct to the mortuary in as unobtrusive a manner as possible; (5) visitors, who should be under surveillance to and from patient areas and during their entire stay in the hospital; (6) staff members who ought to be routed past the record library and the physicians' in-and-out board; (7) out-patients, if any, who may be routed to the laboratory, pharmacy, x-ray, physical therapy units, or other services in the hospital area proper; (8) employees who must be routed past their time control station and locker rooms before being allowed in the hospital proper; and (9) supplies, foods, and wastes, which must be as completely separated from all patient and visitor traffic as possible.

Circulation Space

The area required for circulation space will vary with the type of building and the number of stories.

Corridors. Corridors throughout the hospital should have a minimum width of 7 ft. 6 in., and preferably 8 ft. They require acoustic treatment.

Wall finish should be smooth and washable and finished in light attractive colors.

Finished ceiling height will be the same as other areas, 9½ ft. being desirable. In the main kitchen and laundry 12 ft. ceilings are considered minimum.

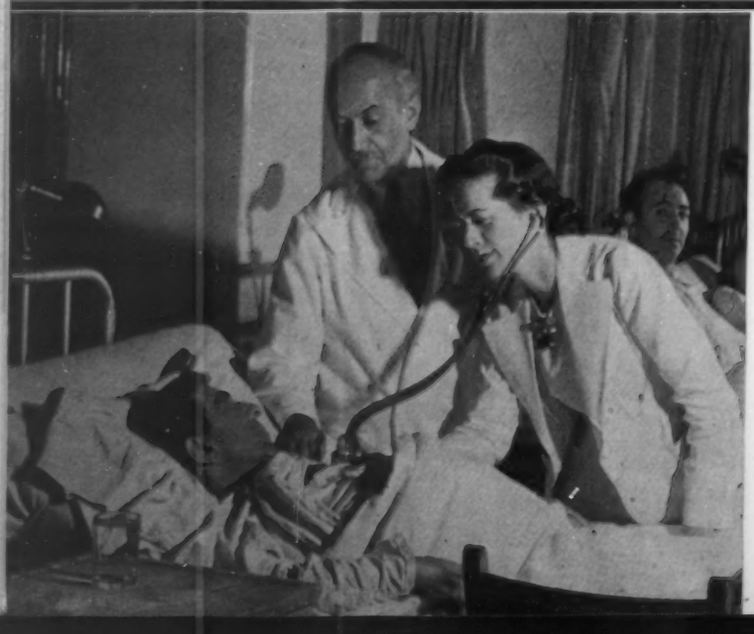
Lighting should be by ceiling fixtures. Indirect, fluorescent, or cold-quartz lighting should receive serious consideration and study. Night lights and electrical outlets for cleaning machinery should be installed at convenient places. Electric clocks to be provided as to be easily visible. Call system installations should be provided as required. Since vacuum outlets or machinery will be required in operating rooms and laboratories, consideration may be given to the installation of master vacuum pumps in the mechanical section to supply ducts opening in corridors as well. This system facilitates cleaning and although original cost may appear excessive, maintenance probably would not exceed that of multiple machines.

An adequate number of fire extinguishers should be recessed in the corridor walls.

Where ramps are required, as in connecting a new and old building, or at the ambulance entrance, the slope should not exceed five per cent.

Stairways. The number and location of stairways is usually determined by local ordinance, with due consideration for traffic demands. Many states require hospitals having more than 100 patients on a floor area of 2,500 sq. ft. to have at least two continuous runs of stairs. Completely enclosed fire stairs are preferable, whether or not required by local ordinance. They should be at least 3 ft. 8 in. wide to permit the carrying of stretchers, with special caution taken to insure sufficient width at the turns. Standard treads and risers, without winders, are used.

Elevators. In grouping of elevators it is preferable to have them adjacent to each other rather than widely separated. If more than two elevators are provided, the separation of service and passenger types is desirable. Elevators should have a minimum size of 5½ ft. by 8 ft. in order to take a bed or stretcher with attendants, and be equipped with dual controls, self-leveling devices, and



ANGELA CALOMIRIS, Black Star

In the nursing department the traffic of patients and staff is a 24-hour parade, confused at certain hours by visitor traffic. Traffic study in the plan stage is quite likely to loom large in success and economy of operation, particularly if it can save steps for the nurses. The flow chart on the opposite page serves as a reminder as to the number and variety of places to and from which the nurse is kept trotting. But remember that each nurse has several patients and each patient will send the nurse flying around the course many times each day

all safety features. It is advisable to install a telephone in each elevator for emergency purposes.

Elevators need acoustic treatment and resilient floor surface material. Doors should have openings of not less than 3 ft. 8 in. Office building and apartment house type doors are not satisfactory for hospital usage. It is advisable that elevators do not open directly on a nursing corridor.

In larger hospitals one car may be designed with doors at both ends so that it may be used from a service corridor during certain hours and for passengers at other times of the day. In locating elevators, special consideration should be given to the flow of traffic. Multistory hospitals up to 125 beds will require a minimum of two elevators, and those up to 200 beds, three elevators.

ADMINISTRATION DEPARTMENT

The administrative offices are grouped in the area adjoining the main lobby and main entrance. Certain sub-groupings should be considered, so that each unit within a sub-group will be conveniently located with reference to each other unit in that sub-group.

For example, the administrator's office, the director of nurses' office, the general business offices, the secretary's office and the toilet facilities for the administrative staff form one sub-group of the administrative facilities, each unit of which should be convenient to each other unit.

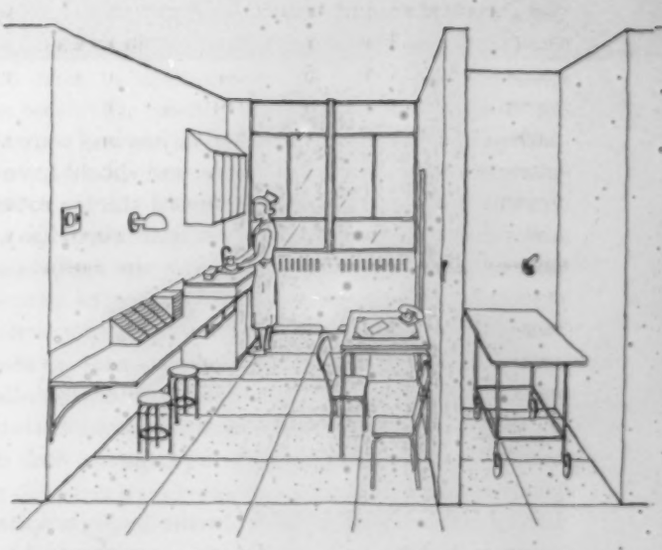
Other sub-groups include: the main lobby and waiting room, the information desk, the cashier's window alcove, and the public toilets; the admitting office, the social service office; the medical record room and that section of the staff room intended for the record study; and the staff room, locker room, library, and conference or board room.

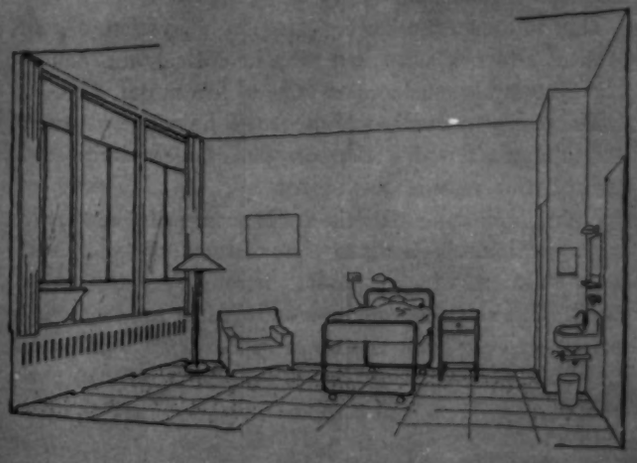
Many hospitals have found it desirable to provide a separate small waiting room in this area for the use of distraught relatives.

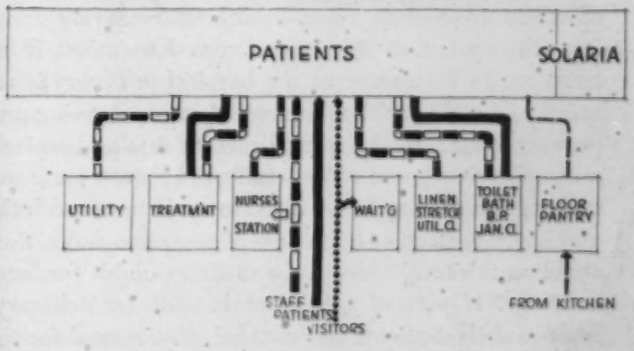
Most of the normal considerations in planning the administration section are indicated in the plans in the June issue; only a few special ones require mention here.

Medical Record Room. The medical record room should be accessible from the admitting office and the out-

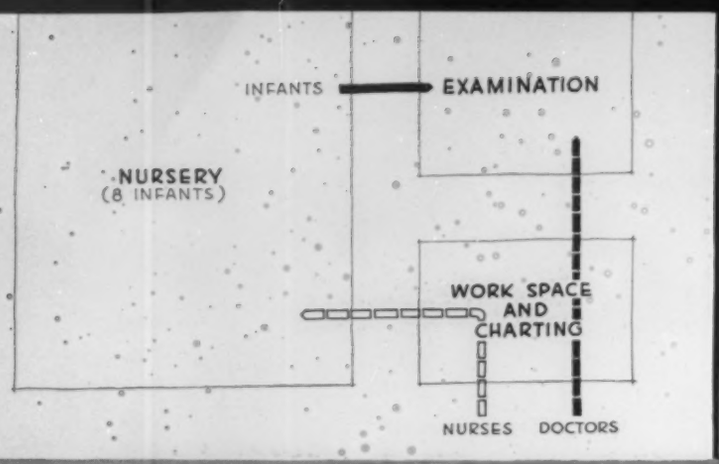
COOKE-PIX Photo





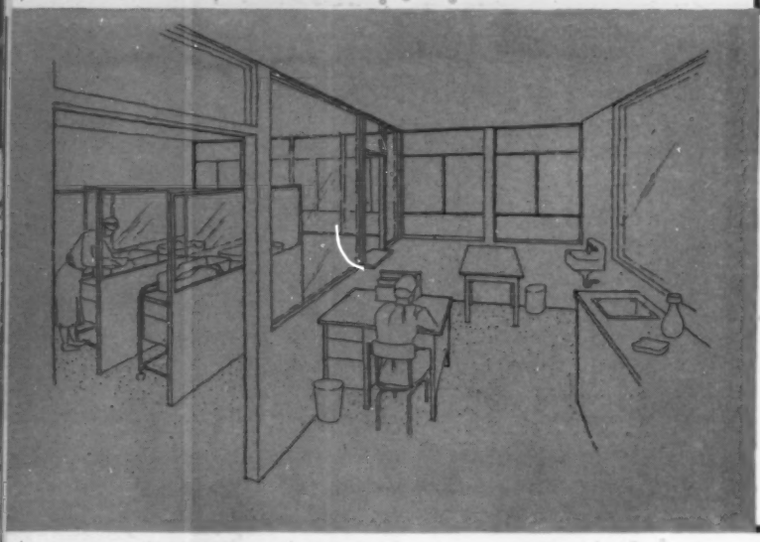


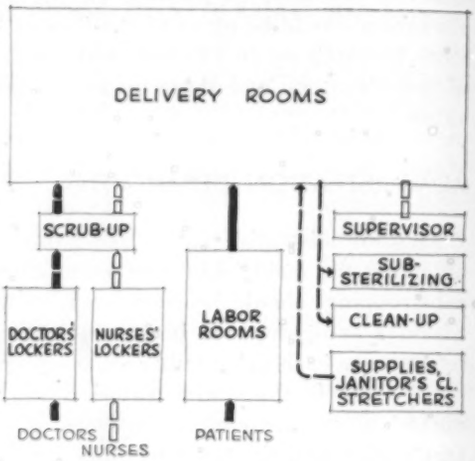
Nursing Department Flow Chart



The nursery is designed to keep traffic to an absolute minimum, for nothing worries the hospital administrator quite as much as the possibility of an epidemic in the nursery, especially the dread infant diarrhea. Thus each nursery is limited to 8 bassinets, representing the number of babies one nurse can care for. Only that one nurse is allowed in the nursery itself; even the doctor sees only one baby at a time, in the examining room. And the nurse has a separate work room, to limit her time in the nursery

Nursery Flow Chart (Left)
Obstetrics Department Flow Chart (Below)





patient department. It may well adjoin and control the entrance to the staff locker room, and should have convenient access to the inactive record storage room below, possibly by a spiral staircase. Space should be available either in the record room or in the staff room for staff members to use while completing their medical records and for reviewing microfilmed records if that system is contemplated. In larger hospitals it may be necessary to provide a pneumatic tube or other device to convey records to and from the nurses' stations, admitting room, out-patient department, and emergency room.

Library and Conference Room. In the larger hospitals, a separate library and conference room should be provided. It is advantageous if this can adjoin the medical record room, thus serving the double purpose of furnishing a control for the library books and space for staff members to consult records without removing them from the control of the medical record librarian. If interns are to be trained at the hospital, a library is required. The library should have adequate shelving and provisions for unbound periodicals. In smaller hospitals a combination board room, staff conference room, and medical library may be arranged in conjunction with the administrator's office by the use of accordion doors, thus enabling the total space to be made available for large meetings. If part of this space is used for a library, built-in shelves should be provided; if it is used for the conference room, a screen and equipment for exhibition of moving pictures and two built-in x-ray view boxes should be installed. If library space is not furnished as suggested above, it should be provided for in the staff lounge or in a record study adjacent to the record library.

Communications Systems. In larger hospitals it is highly desirable to separate telephone and paging service and to restrict the employee's duties, during the day at least, to these communication services. It is often possible to locate the switchboard so that it is separate in the busy hours of the day but, by opening a wicket, may serve as the information desk at night.

In hospitals where the information desk and switchboard are not separated, it is advisable to arrange them so as to permit two employees to function during visiting hours. The information desk should be furnished with the standard information equipment, including the doctors' in-and-out register, the patients' index, and the room register.

The intercommunicating telephone system should connect all work areas and may be entirely automatic. The system also serves as a general fire signal.

The paging control equipment will be adjacent to the switchboard. There are three types of such equipment, each of which has its advocates.

Lights have a very distinct advantage of silence, but are objectionable because they cannot be seen from every point at which the staff or employee will be located. The voice annunciator eliminates the latter objection and for that reason appears to be preferable. However, it must be properly adjusted to obviate the

raucous noise of the paging voice if too loud. Probably the most economical and efficient of the three types is the automatic system which is combined with the intercommunicating telephone switchboard and signals by soft chimes.

The central radio control panel will also be located in the vicinity of the switchboard. Such a system is almost a necessity in the hospital of today and the building should be wired for antennae and ground. Distribution circuits will be included in the nurses' call outlets at the patient's bedside where under-pillow type of rubber encased listening devices can be connected. No loudspeakers are indicated unless in the kitchen, laundry, or other employee work areas, for their convenience and reception of announcements, and if they will not be disturbing to patients. The central radio panel permits choice of programs, records, announcements, and control of hours of operation.

NURSING SERVICES

The determination of the expected distribution of patients will require a special study in each individual instance. Normal expected distribution might be seriously affected by the presence in the community of a specialty hospital, such as a maternity or children's hospital, or by the presence of recognized specialists on the staff of the proposed hospital or of other hospitals in the area.

Studies have indicated that normal distribution of patients in general hospitals might be expected to be: surgical, 45–50 per cent; medical, 20–23 per cent; obstetrical, 12–25 per cent; pediatric (other than newborn), 4–6 per cent; miscellaneous (including eye, ear, nose and throat), 9–15 per cent.

Since bassinets for newborn are not included in the hospital bed count, these do not appear in the percentages given. Space for bassinets, however, is included in the area allotments (page 126). Nursery facilities for newborn infants (including suspect cases) approximately equivalent to 140 per cent of the number of maternity beds will be required.

Patient Areas. The size of the nursing unit is limited by the number of patients that one nurse can care for at night and will normally consist of approximately 25 if mixed one-, two- and four-bed rooms; of approximately 30 beds if no one- or two-bed rooms; and of approximately 20 beds if all one-bed rooms. In small hospitals there should be one-, two- and four-bed accommodations in each nursing unit in order to facilitate nursing service. This makes for the flexibility necessary to group patients on a basis of their medical or surgical conditions.

In allotting beds, unless there is a definite local reason for not doing so, it is well to adhere to the customary relationship of about ⅓ in one-bed rooms, ⅓ in two-bed rooms and ⅓ of the beds in four-bed rooms. A number of one-bed rooms should be designed to permit accommodation of two beds in emergencies.

It is not considered feasible to have rooms of more than four beds in hospitals of from 50 to 200 beds, due to the impracticability of proper segregation of age, sex, race, and medical or surgical conditions in rooms of larger size.

Each nursing unit will contain patient accommodations (included in the "bed area") and those auxiliary nursing facilities required for proper operation. The auxiliary facilities required in each nursing unit include the nurse's station, a solarium, two toilets, a bath, two bedpan rooms, a utility room, flower room, a linen closet and a supply closet. Isolation facilities should be furnished for each unit, but should be arranged so as to be available for other patients when not needed for isolation.

In addition to the facilities needed for each nursing unit, certain other facilities will be required on each floor to serve the nursing units on that floor. These will include a visitors' room, a floor kitchen, a stretcher closet, attendants' toilet facilities, a janitors' closet, and a treatment room. A special nurses' lounge room may be considered if the type of patients expected will warrant extensive use of private duty nurses.

Those designated auxiliary facilities for the nursing units, however, must be so located within each nursing unit as to require maximum travel of not more than 80 ft. to serve patients, and those designated for floors must be centrally located on each floor.

Besides the use of acoustic treatment in areas where noise is expected, structural methods should be used which tend to eliminate sound transmission through floors and walls. Friction hinges or other devices should be used to prevent the slamming of doors.

Doors in patient areas must allow a full opening of at least 3 ft. 10 in. in order that beds may pass through. Even with this width they should be hung on offset hinges or the hinge edge protected by a metal strip or otherwise.

Arm hooks, with hooks pointing downward, are used on patients' room doors. Vision panels are indicated in isolation and psychiatric rooms and in all double-acting doors. The latter also need push and kick plates.

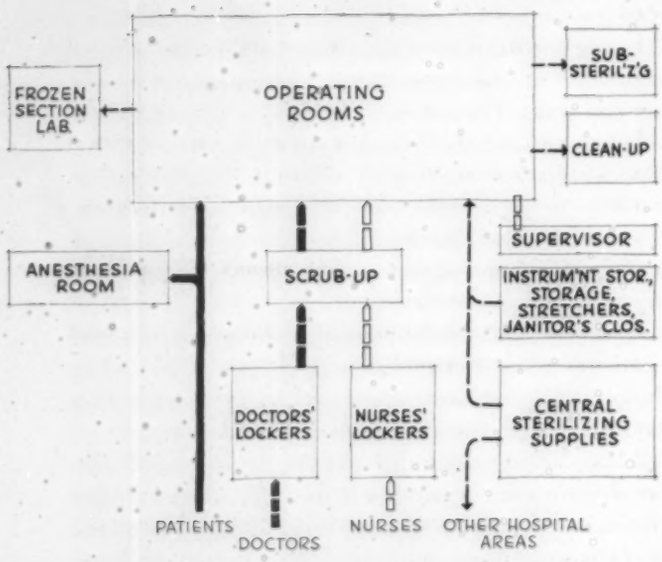
All beds arranged parallel to exterior walls and windows obviate glare or window light or the undesirability of facing an interior wall with no opportunity to look out of the window.

The use of satin finish hardware to prevent glare is suggested.

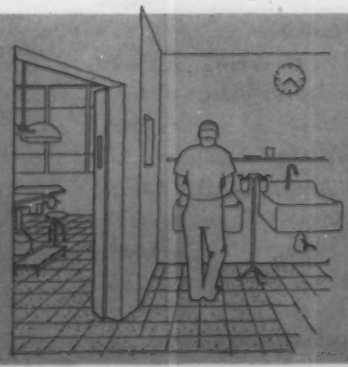
Lighting in patient rooms should be indirect. Bright ceiling lights should not be used. Reading lights, nurses' call, electric and radio receptacles for each bed, and a night light so located as not to be directly visible to the recumbent patient and which can be switched on from the doorway, should be provided. All switches should be silent mercury type.

Window Area. Even with the rapidly increasing use of artificial lighting and air conditioning, natural ventilation and lighting will be required for many years, both for psychological and for financial reasons. While exact window area requirements will vary with climate, building and window design, the average will be 1 ft. of window area to each 3–4 sq. ft. of floor space.

Photo courtesy of U. S. Public Health Service



Surgery Flow Chart



In the operating suite traffic tends to concentrate, both as to space and as to time. When the time comes, everybody moves at once, and everybody moves fairly fast. Thus the operating suite is placed in a dead-end location and traffic is separated wherever possible *(see pp. 84 and 85, June AR)*

Space from the top of the window to the ceiling should not exceed 12 in.

Sill height of 3 ft. is recommended to permit outside view from the patient's bed. The sill must be of substantial material since it is common practice to place items, such as flowers, on it, and for this reason, as well as protection from the elements, it should withstand water, stains, and other damage.

One-bed Rooms. A few one-bed rooms should be equipped with baths, as there will be a need for such so-called "luxury suites." The furnishing of a private bath for each room, however, is regarded as unnecessary, although as many private toilets as funds and space will allow constitute a convenience for many patients and a saving in nursing time. In place of tubs, showers will be substituted in the maternity section. For safety reasons, it is not considered advisable to place showers over tubs for use by patients.

It is advantageous to furnish at least one of the one-bed rooms in each nursing unit with acoustic treatment for use as a quiet room, selecting a room located away from traffic and the noise of utility facilities. It is desirable to have a view window to a quiet room from the corridor, so that the nurse may observe the patient without entering the room. If this is installed, a draw curtain should be provided so that privacy may be secured when required.

Wherever possible one-bed rooms should be of such size as to accommodate two beds in emergencies, thus furnishing flexibility in the capacity of the hospital. Since these rooms may be used for two beds in such emergencies, the wall outlet for the nurse's call and convenience outlets should be equipped for two signal-cords and so located as to be convenient to both beds when the room is used for two patients.

The minimum floor area for any room should be not less than 100 sq. ft. The minimum floor area in any room with an additional emergency bed should be not less than 80 sq. ft. per bed. The suggested minimum width for any room intended for patients' use is 11 ft. 6 in. Furnishing of dressers, as is usually desirable, will require an increase of this figure to at least 12 ft.

Two-bed Rooms. Two-bed rooms should be provided with cubicle curtains, but otherwise similar to the one-bed rooms.

Four-bed Rooms. In the small hospital, and in any general hospital, desirable flexibility is not possible if rooms exceed four-bed capacity. Otherwise they are similar to those discussed above, including cubicle curtains and a lavatory.

Pediatric Nursing Unit. There will normally be no occasion for a separate pediatric unit in small hospitals, these cases being cared for in one- or two-bed rooms.

In larger hospitals, where the patient load permits, rooms should be arranged especially for care of children.

Isolation Suite. Isolation rooms may be arranged in pairs with a single sub-utility room between. The sub-utility room requires no equipment other than a sink with drainboard and a utensil sterilizer.

Each isolation room should have a toilet with bedpan flushing attachment, a lavatory with knee action control and a hook strip for gowns near the corridor door. Otherwise the rooms are the same as ordinary nursing rooms and may be so used when not required for isolation.

One isolation suite should be provided for each nursing unit. It is advisable to locate it either at the end of the corridor or off a sub-corridor. By placing one bedroom opposite the isolation suite, additional isolation beds are available when needed, all to be served from one sub-utility room.

Psychiatric Rooms. Even though it is the policy of the hospital not to accept psychopathic patients, there should be available, in case of emergency, at least one stripped room in the hospital for such patients. One of the isolation rooms may be designed for this purpose.

The room should have enclosed radiators, flush lighting fixtures, no exposed piping, no plumbing fixtures. Windows should be of detention type. The door should open into the corridor, locked from outside with no hardware inside and should have a vision panel of shatterproof glass. Electric switches and thermostatic heat control should be outside the room on the corridor. Acoustical treatment is required.

Nurses' Station. A nurses' station is necessary for each nursing unit and so situated as to save as many steps as possible for the nurses. It should be open to the corridor, with, perhaps, counter or rail separation. These stations should preferably be located where visitor entry by stairs and elevators can be controlled.

In larger hospitals where there is more than one nursing unit to a floor, the nurses' station will be centrally located in the nursing unit, and a floor supervisors' station will command the visitor entry.

Acoustic treatment is necessary. In larger hospitals that are provided with pneumatic tube systems, connection with the medical record room may be supplied. Also, in larger hospitals, a dumb-waiter to the central supply room may also be desirable.

Consultation Room. On each floor it has been found highly desirable to have a small room to serve as an office for the intern or resident physician, and where attending staff members can retire for consultation and conferences with physicians, patients, or patients' families. Such a room would require space for a desk, chairs, bookcase, locker, lavatory and house telephone.

Utility Room. The utility room should be centrally located in each nursing unit. It should be noted that the utility room suggested is not intended for bedpan cleansing or sterilization, nor for the sterilization of such supplies as are expected to be furnished by the central supply room. Acoustic treatment of this room is necessary. A 3 ft. 10 in. door with vision panel is required.

Floor Pantry. If central tray is used, the floor kitchens will have only minimal equipment, and will not need to be equipped for setting up trays. They should be in such location as will permit dumbwaiter service from the main kitchen.

If decentralized tray or bulk food service is contemplated, a larger area than that suggested in the accompanying area tables, and additional equipment, will be required.

Solarium. A solarium at the end of each patient wing is highly desirable. It should be so arranged as to be available for utilization as bed space in emergencies.

Visitors' Room. A visitors' room for each floor is highly desirable. It should be located close to stairs and elevators, and under control from a nurses' station. In larger hospitals where the maternity service is heavy, it is considered good practice to provide a special waiting room for prospective fathers. Such rooms should be provided with a public telephone and acoustic treatment. Convenient toilets and lavatories are desirable.

Flower Room. Space should be provided for a much needed work room for handling of flowers. This feature has been too often omitted in hospitals.

Toilet—Bath—Bedpan. Each nursing unit will be furnished with centrally located toilet rooms, bathroom, and bedpan unit. The toilet rooms are arranged with doors opening out and may be provided with a nurses' call button. Two separate patient toilets should be provided for each 25-bed nursing unit. Acoustic treatment is advantageous in toilets.

Since separate bedpan units are to be supplied, facilities for disposal and bedpan washing should not be required in the toilet rooms.

The bathroom should be provided with a tub but no shower because of danger to patients. Actually, few patients take tub or shower baths in general hospitals. Stall showers are required in the maternity and isolation units, but never over tubs. One bath in addition to any private facilities should be provided for each nursing unit.

Closets—Linen—Supply—Stretcher—Janitors. One linen and one supply closet will usually be required for each nursing unit. One stretcher closet and one janitors' closet on a floor will usually be sufficient.

SURGICAL DEPARTMENT

Operating Suite. It is important that the operating suite be completely isolated from the rest of the hospital, and so located that there will be no traffic through it. Hence it should be located either on a separate floor or in a separate wing with convenient access by elevators to all patient floors.

Operating Rooms. Approximately one half of the patients admitted to a general hospital require surgery. Since approximately 3600 patients would be admitted annually, an average of ten each day, the average 100-bed hospital will need facilities for three to five operations daily. Assuming that preparation of the room, performance of the operation, and cleaning processes would require an average of three hours, it is improbable that a particular operating room would be used more than twice daily. This is caused by the fact that the surgeons prefer operating in the mornings only, and the majority of them schedule office hours, consultations and other commitments for the afternoons.

Hence, the average 100-bed hospital will require two major operating rooms and one minor, one cystoscopic and one orthopedic room. Other than with exceptional circumstances discussed above, as the hospital increases in size, one major operating room will be necessary for each additional 50 beds. It must be noted, however, that for the very large hospitals a close analysis of types of patients is indicated, as a shift in percentages, or emphasis upon another type of patient will materially affect requirements.

Even in the small hospital there should be a minimum of one major and one minor operating room, although there is little difference in the two units. In very small hospitals it may be impossible to provide more than one operating room, and minor surgery may be performed in the emergency room, but otherwise at least two operating rooms besides emergency should be provided.

Operating rooms are best arranged in pairs, with scrub-up and sub-sterilization facilities between each two. Orientation of operating rooms is not important, since artificial light will be used. Glass skylights and large windows for north light are no longer considered necessary.

Unless the institution is a teaching hospital, observation galleries will not be required. Where supplied, access should be other than through the operating room. Glass separation from the operating area is usually indicated.

Air conditioning is recommended, and equipment should be such as to maintain an 80° temperature and a minimum of 55 per cent relative humidity with NO recirculation of air. In smaller hospitals, explosion-proof unit air conditioning may be used.

The desirable minimum size for operating rooms is 18 by 15 ft.

One operating room should be equipped with light-proof shades for special eye or other dark room surgery. Unless a special orthopedic room is furnished, either one of the operating rooms or the emergency room should have a plaster sink.

In all areas where anesthetic gases are used, special provision is necessary to guard against the explosion hazard. Spark-proof electrical equipment, conductive flooring (such as cupric oxychloride cement, conductive asphalt tile, conductive linoleum, or conductive rubber) or whole alloy or brass strip grids on 4 in. centers with terrazzo or tile flooring must be provided. Tile floors with zinc filings in the cement mix have also been used.

All equipment must be grounded. The electrical equipment will include explosion-proof switches, guarded light bulbs, and enclosed motors and rheostats. All electrical outlets must be at least 2 ft. above the floor. All operating room areas should have non-glare walls tiled to a minimum height of 6 ft., and preferably to the ceiling.

Cystoscopic Room. This room, if installed, may be provided for in the operating suite area where continuous surgical supervision can be given. Since this will be more or less remote from the radiology department, portable x-ray apparatus will be supplied.

Fracture Room. In hospitals of 100 beds or more a special fracture room is needed. This may be in the emergency area or surgical suite, the latter being preferable. Fixtures are explosion-proof as anesthetic gases will be used. Light-proof shades are required.

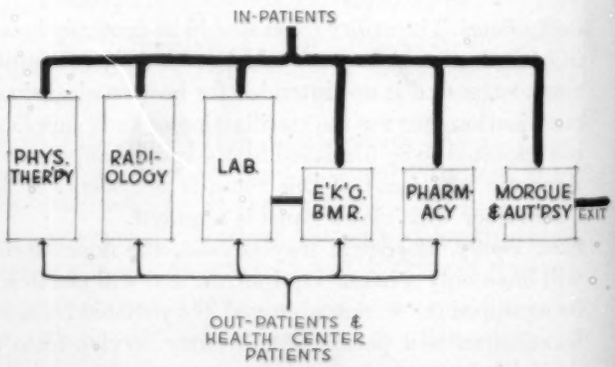
Splint and Plaster Closets. Adjoining the fracture room it is desirable to have a splint closet and a plaster closet.

Sub-Sterilizing Rooms. Adjunct sterilization facilities will ordinarily be located between each two operating rooms. Direct access from each operating room and the corridor is desirable. The water sterilizers and pressure sterilizer should preferably be built in, with access provided. No storage space is required. A blanket warmer may be desired, but indications are that the electrically heated blanket will replace this item.

Scrub-Up. Scrub-up facilities should be supplied for each pair of operating rooms, allowing three sinks for each pair of operating rooms. A glass view window between the scrub-up sink area and the operating rooms is frequently advantageous.

WOOLF-PIX Photo

In the placing of adjunct diagnostic facilities, there is double traffic to be considered, for out-patients as well as in-patients. A first-floor location is best



Adjunct Diagnostic Facilities Flow Chart

Clean-Up Room. One clean-up room for the surgical area is sufficient. It is located close to operating rooms.

Laboratory. In hospitals of 100 or more beds, a small space may be required for frozen section examination. The space may have fixed equipment, or a portable truck with necessary equipment may be brought from the main laboratory. In addition to equipment for frozen sections, a small sink and work counter may be provided.

Instrument Room. In the very small hospital a separate instrument room may not be required, built-in cabinets in the corridor or central supply room usually being sufficient. In hospitals of 100 or more beds a special instrument room is almost a necessity, the minimum width being 8 ft. and the area about 150 sq. ft. For each additional operating room 30 to 50 sq. ft. should be added.

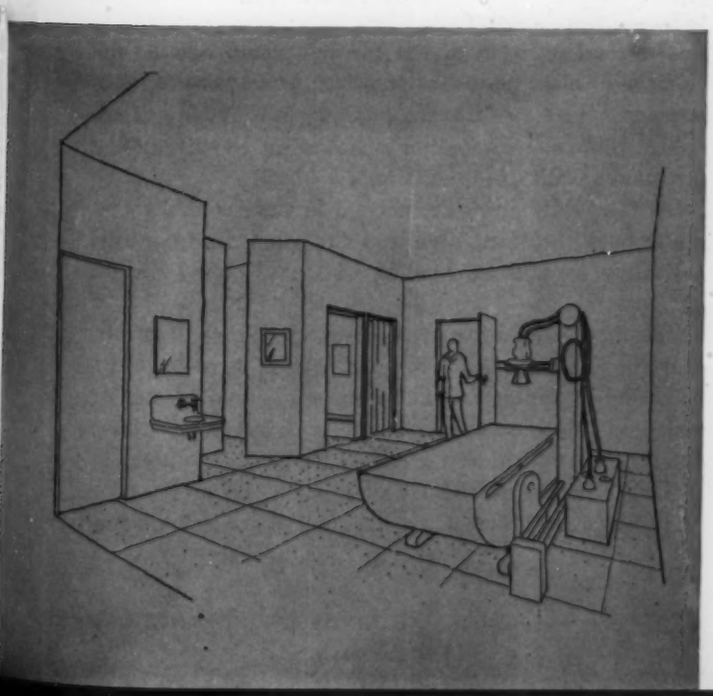
Anesthetics Equipment Room. A special fireproof room is necessary for the storage of ether, anesthetic gases, and anesthesia equipment. This room should be convenient to the operating rooms, but open upon the corridor. It requires ventilation, either natural or artificial, and other specifications to comply with local fire ordinances. Radiators should be omitted. A small amount of shelving is needed.

Corridor. A special blackboard for scheduling operations should be installed in the corridor, in addition to a standard bulletin board. Telephones may be needed. Fire extinguishers should be recessed in the wall in this area.

Stretcher Closet. A stretcher closet to accommodate one stretcher for each major operating room is necessary.

Storage Closet. This storage closet is intended for extra operating room equipment and attachments. Shelving should be provided with the lowest shelf not less than 4 ft. above the floor. This permits heavy equipment to be stored below the shelving.

Janitor's Closet. Whether or not there is a janitors' closet elsewhere on the floor, a janitors' closet should be furnished in the operating suite area.



Doctors' Locker Room. The doctors' locker room is best situated at the entrance of the surgical suite. It should be attractively furnished with tables and chairs.

Nurses' Locker Room. The nurses' locker room may be within the surgical suite, since the nurses will not be in street clothes when they arrive.

Surgical Supervisor. In the small hospital, desk space off the operating corridor may be set aside for the surgical supervisor. In the larger hospitals, a separate office will be required, so placed as to control the department. In larger hospitals, additional space may be provided for a medical stenographer.

Central Sterilizing Room. The areas suggested for the operating suite include a central sterilizing room which will serve the entire hospital.

The central sterilizing and supply service prepares, sterilizes and assembles all supplies for use wherever needed. The concentration in one location of all sterilizing results in a saving of equipment, time and supplies, and permits a higher standard of work on the part of skilled personnel.

The central sterilizing room is best located at the entrance to the operating suite. This is usually a central location with respect to the other departments to be served and also permits the operating room nursing staff to help in the preparation of supplies during their free time.

The space is divided into three distinct areas which may or may not be physically separated: (1) work area for receiving and cleaning unsterile material and for assembling packs; (2) sterilizing area for sterilizing supplies; (3) sterile supply area for storage and issuing of sterile supplies. In addition, it is desirable to provide (adjacent to the work area if possible) a room for the storage of unsterile supplies which are distributed from the central sterilizing room.

A dumbwaiter connection between the central supply room and other floors is suggested to cut down traffic to the operating floor.

OBSTETRICS DEPARTMENT

Maternity Services

The nursing accommodations will be the same for obstetrical patients as for other types of patients except that there may be increased provision for toilets and showers.

In considering the nursery and delivery room suite in their relationship to each other, they should be as far removed as the limits of the obstetrical department will permit, since the large number of visitors to the view windows of the nursery would be a potential danger if permitted near the delivery area. Isolation facilities for about one maternity patient in each 15 are imperative.

Twelve to twenty per cent of patients in the average general hospital will be maternity cases.

Obstetrics Suite

Delivery Rooms. Delivery rooms should be provided in the approximate ratio of one delivery room for each 20 maternity beds or less, regardless of how small the hospital. These will be essentially similar to operating rooms in design. In larger hospitals, one of the delivery rooms should be equipped for major operative procedures.

Labor Rooms. Labor rooms are needed in the approximate ratio of one labor room for every 10 maternity beds and adjacent to delivery rooms. They are of the general type of ordinary patients' rooms.

In general the facilities in the obstetrics suite are similar to those in operating rooms — scrub-up, sub-sterilizing, clean-up, supply closet, supervisor's office, doctors' lounge, etc. Some authorities call for a special work room for preparation of supplies used only in this suite. A treatment room within the maternity section but not in the delivery suite has been recommended.

NURSERY

The nursery area is located in the maternity section, but removed as far as possible from the delivery suite. It should be readily reached by visitors wishing to observe the infants through the nursery view windows, without the necessity of passing through corridors in patient areas.

It has been calculated that the number of bassinets must amount to approximately 140 per cent of the number of maternity beds to provide an allowance for premature births, with their longer stays in the hospital, and for suspect cases.

It is suggested by the children's Bureau of the U. S. Department of Labor that the normal new-born nurseries be limited to a maximum of eight infants each. The figure is based on the number of normal infants that can be adequately cared for by one nurse.

There should be no entrance to the nursery from the corridor, since controlled access through the nurses' station is preferable. Separate cubicles and facilities and supplies for individual technique should be provided, with a minimum of 30 sq. ft. of floor space and 270 cu. ft. for each bassinet. Air conditioning for nurseries is recommended, permitting a 78° temperature and a relative humidity of from 50 to 55 per cent. Acoustical treatment is required. Each nursery should be provided with lavatory facilities with knee control. Sterilizing lamps may be considered, especially in nursery air supply ducts of the air conditioning system.

Premature Nursery. Facilities for the care of a minimum of two premature infants must be supplied even in the smallest hospital. The same space per bassinet will be required as in the normal nurseries.

Separate nurseries for premature infants are limited to a maximum of four prematures in any one nursery. This represents the number of prematures that can be adequately cared for by one nurse. Individual heated bassinets or incubators with temperature and humidity control should be furnished, hence air conditioning will not be required in the premature nurseries. Otherwise, the premature nurseries will be similar to the normal nurseries. In hospitals having ten or less maternity beds, a separate premature nursery will not be required; incubators placed in the normal nursery will suffice.

Work-Space and Examination Room. Each nursery should connect with an ante-room that serves as work space, nurses' station, and examination room. Where there is more than one nursery for normal and premature infants, the nurseries may be so arranged that one ante-room serves two nurseries. The ante-room is designed with three areas, one for examination and treatment, one for the nurses' station, and one for the work-space. Thus, only the nurse actually enters the nursery proper.

The nurses' station area should be designed as a "control station," with the nurse's desk so located that she can control the entrances from the corridor to the ante-room and from the ante-room to the nurseries.

Suspect Nursery. The suspect nurseries are designed to accommodate a number of bassinets approximately equal to 20 per cent of the number of beds supplied for maternity patients in the hospital. These nurseries should be completely separate from the normal and premature nurseries. A minimum of 40 sq. ft. of floor space and 360 cu. ft. of space is provided for each suspect bassinet. Even smaller hospitals require a minimum of two suspect bassinets. The suspect nursery may have up to three bassinets, since the technique is primarily that of observation rather than strict isolation of a contagious disease. Definitely diagnosed infections cases are removed entirely from the area for isolation.

Suspect Ante-Room. An ante-room is arranged between the suspect nursery and the corridor. One ante-room may serve two suspect nurseries. It should be provided with a lavatory as above, a desk and shelf, a hot plate and cabinet for necessary supplies. The viewing windows will be so arranged that the infants may be seen from the corridor.

Formula Room (Milk Room). Location of the formula room is the subject of some difference of opinion on the part of clinicians and administrators. Possible locations are the dietary department, the maternity department and the pediatric department.

The final location of the formula room can be decided only after consultation with the hospital administrator, director of nurses, pediatrician, and dietitian.

The following discussion is based on the use of the terminal sterilization technique.

Two separate areas are needed in the formula room, one a bottle washing area and the other a preparation and filling area. They need be separated only by a low partition.

The bottle washing area should be located off the corridor to receive soiled bottles. It should connect with the filling counter by an opening in the separating partition. A recessed rectangular pressure sterilizer should be provided at the end of the filling counter.

Wall cabinets should be avoided in the preparation and filling area because of the danger of foreign material

falling into the formula. Handwashing sink, a deep sink for utensil washing and small refrigerator are required. A small desk space is recommended.

ADJUNCT DIAGNOSTIC FACILITIES

Laboratory. The extent of the area assigned for the laboratory is based on the assumption that a pathologist will be available. While in some small hospitals such a qualified individual may not be available, and pathological specimens have to be sent elsewhere for examination, a part-time arrangement may be made that is both practical and feasible.

If, however, no pathologist is available, the laboratory area may be reduced to approximately 200 sq. ft., but, since the larger area may later be required, this is not recommended.

In the small hospital of 50 beds or less one room for all laboratory activities will suffice. In larger hospitals it is usually necessary that separate areas be assigned for pathology, serology, bacteriology, chemistry, hematology, urinalysis, blood bank or other special services.

In the latter, an office for the pathologist and perhaps a secretary are indicated. A small room may be provided for out-patients coming to the laboratory, unless specimens are taken in the out-patient treatment rooms or in a small out-patient department laboratory designed for routine procedures. This room might also serve as a bleeding room if the hospital contemplates installing a blood bank. It is advisable to consult the pathologist as to rooms required and their design, especially for the larger hospitals.

The laboratory should be on a lower floor and so located as to be accessible to members of the medical staff and to out-patients who may be sent to the laboratory for specific procedures.

Radiology. The department of radiology should be so located as to be conveniently accessible to the in-patient areas, as close as possible to the emergency rooms, and to the out-patient clinics if these are in the hospital. The location should be such as to permit adequate natural ventilation and freedom from dampness.

Detailed requirements of the departments should be governed by the advice of the radiologist, since these requirements may vary widely, depending on the types of services contemplated.

In the small hospital, minimal provisions will include a space of not less than 200 sq. ft. for both radiography and fluoroscopy.

In larger hospitals this may be extended to include a separate radiographic room or rooms, fluoroscopic room, therapy room, viewing room, office, waiting room. A special electrical current source for radiology should be arranged with separate power line to prevent current fluctuation and provisions made for adequate grounding. Installation of the radiologic unit should permit access to the machine, preferably from both sides, by a bed or stretcher.

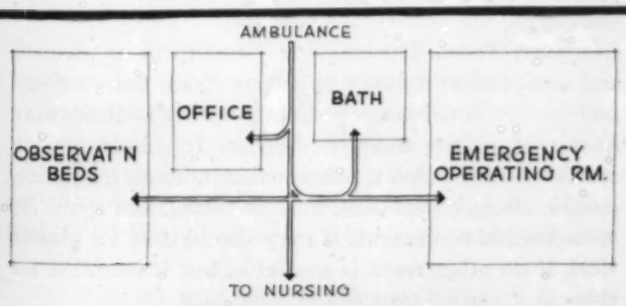
Basal Metabolism, Electrocardiography. One room will usually serve this dual purpose and should be in a quiet location. Except for equipment, it will be similar to a one-bed room. Since these tests and observations are usually by, or under the general supervision of the laboratory technician or director, reasonably convenient access to the laboratory is preferred.

Draw curtains, or other methods of darkening the room will be necessary, and separation by a cubicle curtain to eliminate possible distraction of the patient is advisable. Acoustical treatment of the ceiling is preferred.

Physical Therapy. Even the smallest general hospital will have considerable physical therapy and the trend is towards increasing this form of treatment and concentrating required facilities. This permits more extensive use and efficiency under trained supervision, in caring for both in-patients and out-patients.

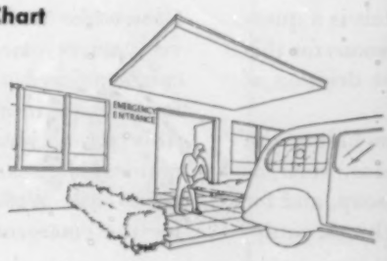
The principal divisions of the department are for electro-therapy, hydro-therapy, and exercise. The former is by far the most extensive in the average hospital, and in the small unit may constitute practically the entire activity. Short-wave diathermy, infra-red, and ultra-violet equipment are essential.

Hydro-therapy is better separated from the electro-therapy area. Facilities here vary from small mobile



Emergency Section Flow Chart

Traffic to the emergency suite usually comes via ambulance or police car, will range from drunks to multiple accident cases, and will usually include policemen and friends, hence the office for waiting



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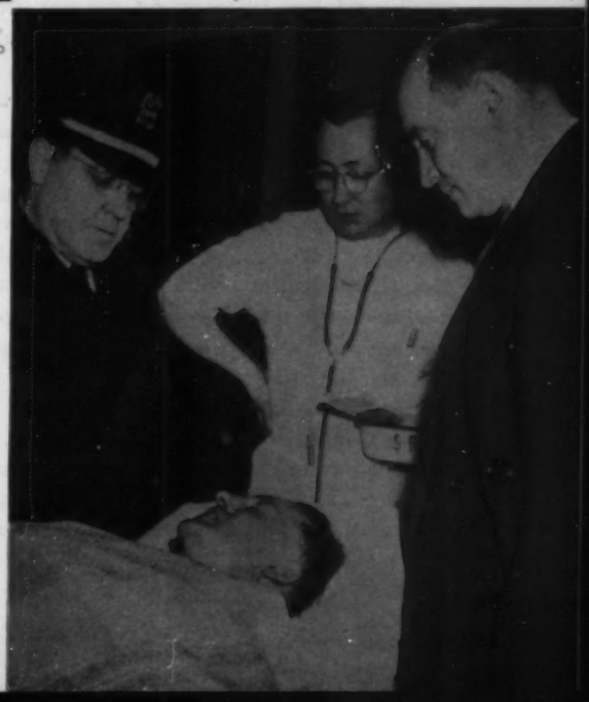
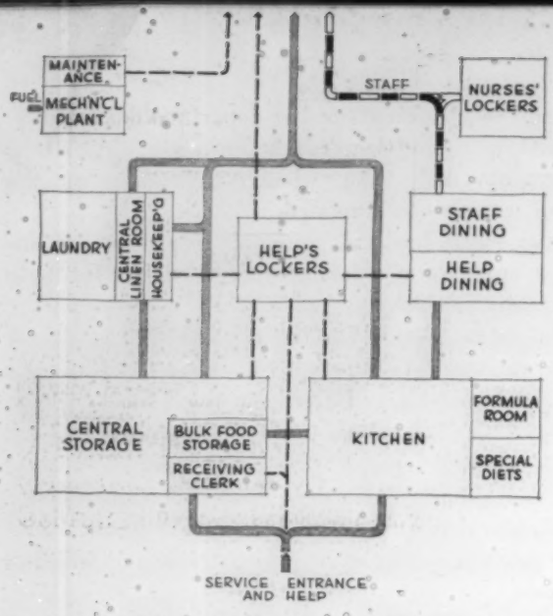




Service Department Flow Chart

The service department is another of the heavy-traffic areas, with much hustle and bustle, with virtually all professional and non-professional personnel coming through at various hours, not to mention delivery service. The flow here charted is based on the central storage system in which all incoming materials are thus centrally controlled. Except for perishable foods, all kitchen supplies are stored there, and checked out as required. The kitchen is designed for the central tray system, in which all cooking, serving and dish-washing is done in the main kitchen. Best location is a basement space which is above grade at the rear, to separate out all delivery traffic

tanks to elaborate installations of swimming pools, Hubbard or other tanks, showers, continuous flow and Sitz baths. Tanks and wringer for hot and cold compress applications, and fixed or mobile arm and leg baths may be desired.

The exercise area, if furnished, requires bars, posture mirrors, steps, ladders of various types, pulleys, walkers, or other similar equipment determined by extent of the department.

Pharmacy. The area suggested for the activities of the pharmacy does not include space for bulk storage of pharmaceutical supplies, these being provided for in the area allotted to general stores.

In the small hospital nothing more than a dispensing pharmacy will be required. It should be convenient to the out-patient department, if any, and accessible to the elevators for service to the various nursing stations.

Space will be required for a refrigerator and a safe for narcotics. The prescription section should conform to the equipment specifications of the National Association of Boards of Pharmacy and the American Pharmaceutical Association. If the hospital is extremely small, and has little or no out-patient department, a dispensing pharmacy may not be required, drug room being sufficient.

Solution Room. In hospitals of 100 or more beds, a separate area for the preparation of solutions is considered desirable.

If processing of blood plasma is contemplated in the hospital, consideration should be given to combining the processing laboratory with the solution room.

Manufacturing. Determination of the extent to which manufacturing will be done in larger hospitals is a question of policy, and the extent to which provisions for this activity are furnished will be subject to the decision of the governing agency of the hospital.

Space is assigned for manufacturing, including the preparation of large quantities of solutions, such as mouth washes, rubbing alcohol and liquid soap, and for facilities such as ointment mills, tablet machines, equipment for filling collapsible tubes and ampules, extracting and filtering. A water-resistant floor with drain, and adequate shelving and work space are required in this area.

The manufacturing room may be located in the basement, directly under the pharmacy. A dumbwaiter should connect it to the pharmacy, and there should be means of direct access to the pharmacy and to the bulk pharmacy stores.

In the smaller hospital, where only one pharmacist is on duty, often without assistance, it is preferable that the manufacturing room be adjacent to the pharmacy to obtain more efficient utilization of that employee's time.

EMERGENCY DEPARTMENT

The emergency department should be so located that patients arriving by ambulance may have direct access to the emergency room. For this reason this department is usually located on the ground floor in the rear of the hospital building. The emergency entrance should have a convenient loading platform or a ramp and a marquee to protect patients being taken from cars or ambulances. Doors should be of a width to permit easy access of stretchers.

Emergency Room. The emergency room will be planned and equipped as a minor operating room, but scrub-up and (except in the larger hospitals) utility facilities may be placed in the emergency room. It should have a special medicine closet, poison cabinet, house telephone, electric clock, nurses' call, bulletin board, and space for resuscitation equipment. It may also be used for plaster work if no other room is available, but if intended for this use a plaster trap will be necessary.

Observation Beds. It is recommended, in hospitals with very active emergency services, where proper nursing can be assured, that a few beds be furnished in this area for patients in shock, for moribund patients, and possibly for accident patients suspected of having communicable disease.

Office and Waiting Room. An office and waiting room for the emergency section is suggested for all but the

courtesy of U. S. Public Health Service

WIDE WORLD Photo

smallest hospitals, to be convenient to the emergency entrance and to have a public telephone.

Stretcher and wheelchair space, toilet facilities, and a storage closet are required. The larger hospital will need a bath in addition.

SERVICE DEPARTMENTS

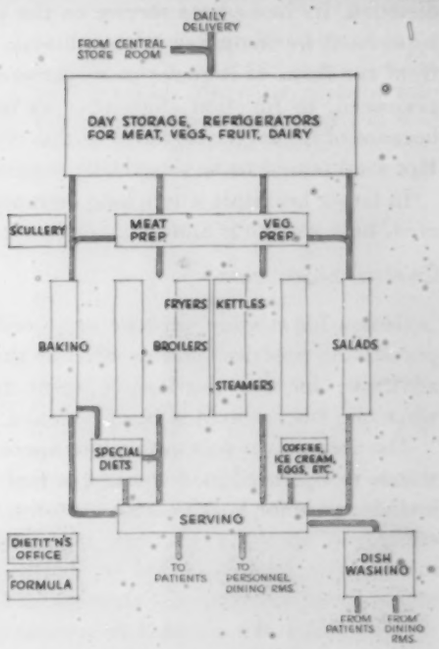
Dietary Department

The areas assigned to the dietary department in the accompanying area tables are based on the use of the centralized tray service. There is considerable controversy over the relative efficiency of central tray and bulk food services, each type having both advantages and disadvantages. Since food is a most important factor in patient welfare and public good will, very serious study must be given to the method to be adopted before plans are drawn.

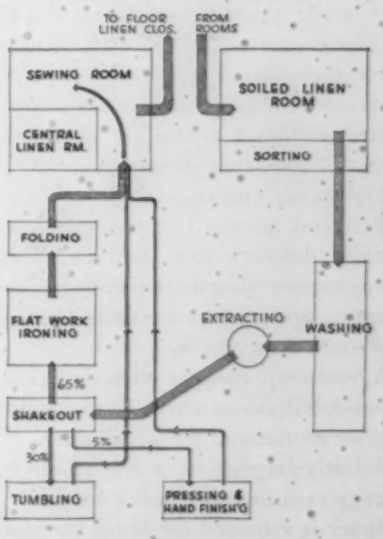
Under central tray service, patients' trays are completely served in the main kitchen, loaded on tray trucks, either open or insulated, and transported to the floor to be served to the patients. Soiled dishes are collected and returned to the central dishwashing room. The work of setting up the trays is done under the immediate supervision of the dietitian who is expected to check each tray for contents and appearance.

This system requires less personnel, though better trained, and there is some saving in initial equipment costs. The most serious complaint is that food becomes unpalatable by the time it reaches the patient. Many authorities state that this can be overcome by efficient organization.

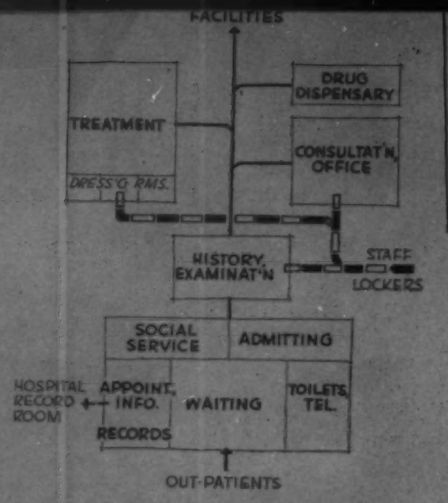
The bulk service system utilizes an insulated, heated cart somewhat like a steam table. Food is loaded into the cart in bulk and transported to the patient area. In the meantime, trays have been prepared in the floor pantry and, under the best use of this system, a tray truck accompanies the food truck down the nursing corridor. At each room the patient's tray is served from the bulk cart. Soiled dishes are usually handled in the dishwashing room which requires a dishwasher on each floor.



Kitchen Flow Chart



Laundry Flow Chart



Out-Patient Department Flow Chart

Traffic in the out-patient department originates outside the building, of course, but it may go on in to diagnostic or therapy facilities. Goal is to limit and isolate this traffic

WOOLF-PIX Photo

Advocates of bulk service claim that while preparation and general service of food as a therapeutic measure must be under the immediate direction of a competent dietitian, its immediate service to the patient must be supervised by the nurse in the absence of the dietitian from the floor. It requires more personnel, but less experienced, to function efficiently, an important factor because of the larger turnover in this class of employee. Hot food is said to be practically assured.

In larger hospitals where long distances must be covered, bulk service is almost mandatory.

Central Storeroom

Design for storage must be in accordance with local purchasing practices and needs. For these reasons it is advisable for the purchasing agent to be consulted when the storage area is being planned.

The area shown does not include space for kitchen day stores, refrigerated food storage, or fuel storage. It does include space for bulk pharmacy stores, facilities for the storage of special type beds, large orthopedic equipment, extra equipment, and for all supplies and replacements to be issued for use throughout the institution.

If the hospital is situated away from central markets, the space must be proportionately larger so as to allow time for replacements and to permit storage of economic purchasing quantities based on shipping rates.

Pharmacy stores are usually handled by the pharmacist rather than by the general storekeeper, hence are separated from the main stores. Also, by this arrangement, pharmacy stores are available without allowing access to the other storerooms.

The main entrance to the storeroom will be kept locked and no one but the storeroom staff, and occasionally delivery men, will be expected to enter the storage space. Requisitions will be turned in at the office window, and deliveries made up in the storage space and sent to the floors.

A make-up counter directly outside the office and near the hall doors allows for the collection of items from various sections of the area easily.

A fairly large space is left at the front of the general storage area for very bulky items.

Space is required for filing (or storage) of "inactive" medical records, possibly in the basement immediately beneath the medical record library and connected with it by a spiral staircase, but in any event easily accessible from the main record room. If this space is not in the basement, the weight of heavy files must be considered in designing the floor construction.

Provisions for storage of films should meet requirements of local fire ordinances and the National Board of Fire Underwriters. Present regulations exclude quantity storage of nitrocellulose film inside hospital buildings.

It is highly desirable to have a space set aside for furnishing minor items for patients and employees. It may supply newspapers, magazines, toilet articles, tobacco, cold drinks and confections by sales-service or may be limited to vending machines.

OUT-PATIENT DEPARTMENT

Original design should, if possible, allow for future additions for this important function if it is not incorporated in the initial construction phases. Otherwise when it is developed, as it probably will be, the department will be forced into areas remote from necessary adjunct services, and in poorly lighted or ventilated space designed for other purposes. This latter is usually at the expense of storage or other space necessary to efficient operation of the hospital. Traffic lines become confused and complicated

Out-Patient Departments are subject to extreme variation, but commonly are regarded as entirely separate from hospital in-patient service, though for economy, they should, when possible, utilize the hospital adjunct services. They are not included in the relative area distribution tables, and any area assigned to this function must be added to the areas assigned to the hospital proper.

Figures available indicate a variation of from ½ to 2 out-patient visits per day for each occupied bed. Normally the lower figure should prevail in average communities having the usual health department clinic organization. Estimated area requirements for out-patient departments approximate 40 sq. ft. of floor space for each expected average daily patient-visit. Waiting room space is on the approximate basis of 12 sq. ft. per patient-visit, because patients are often accompanied to the clinic by relatives.

NEW CONCEPTS IN STORE LIGHTING

By Kenneth C. Welch*, A.I.A., I.E.S.

* Vice-President, Grand Rapids Store Equipment Company, Grand Rapids, Michigan. Note: This discussion by Mr. Welch appears in the May 1946 issue of Illuminating Engineering, and is presented in the RECORD in accordance with original plans to acquaint the architect concurrently with this important design problem.

THE simplicity and directness of a well-designed and effectively lighted store is not an attempt to create a new style, but the result of common sense that says that any store selling a considerable amount of merchandise, bought largely on impulse, must first attract the prospective customer's attention to that merchandise. Too much interior ornamentation, and row upon row of bright lighting fixtures merely distract the eye. The day is past when architects and engineers thought store lighting meant treating the store interior as a box to be filled with as much light as possible, or merely as a background for wall and ceiling lighting that would be most ornamentally striking.

BRIGHTNESS

Illumination is only useful and visible to the human eye when transmitted through or reflected from some substance. The amount of illumination and the degree to which a substance reflects or transmits light creates a given brightness. Our store problem discussion can be simplified somewhat by assuming that the final result we are seeking, from the customers' standpoint, depends largely upon reflected light. The basic formula for evaluating a reflecting surface is relatively simple. The amount of light, which usually is measured in footcandles, multiplied by the reflection factor, which is the percentage of total light reflected, equals the brightness, measured in footlamberts.

In a store one runs the gauntlet of merchandise made of all types of materials, with reflection factors ranging from a fraction of one per cent for dark fabrics, up to eighty per cent or more for lighter materials and merchandise with specular surfaces, such as silverware and electrical appliances. This fact and the designer's inability to control these reflecting surfaces make the store lighting problem that much more complex.

VISUAL VIEWPOINT

Store lighting is different in its concept from any other general lighting problem. It is perhaps most closely allied with stage lighting, except that in a store there is a multiplicity of viewpoints in motion instead of the fixed and directional viewpoint of the theater seat.

The first consideration of viewpoint calls for a study of the various zones of the field of vision. One way of expressing it is illustrated in Fig. 1. This illustrates the three zones of vision and helps in defining various viewpoints. Calling the line of horizontal fixed gaze the central axis, the total field of vision can extend almost 80° to 90° to each side and below this central axis, and about 35° to 40° above it. The restricted upward angle is of course due to the eyebrow obstruction. One is only subconsciously aware of general areas and objects in the outer parts of this zone, but can be conscious of and distracted by lesser areas of comparatively greater brightness anywhere within the zone.

Then there is what can be called the immediate field of vision, extending through an approximate angle of 40° to 60°. It is the cone within which one is quite conscious of varying brightness and forms, and over which the concentrated gaze can roam quickly and unconsciously by moving the eyes. In addition, it is easy to turn one's head, and since there is a continual change in the direction of the body as one walks through a store, the scope of concentrated vision in a more or less horizontal plane is increased materially.

It is also easy and natural to lower one's gaze when attention is attracted in that direction but it is less natural, particularly in a store, to concentrate one's gaze much over 12° to 15° above the horizontal. This viewpoint is illustrated in Fig. 2, and is the basic reason why about 45° above the horizontal can be considered a safe cut-off angle when shielding primary light sources. The normal field of vision in a store can be defined as being unlimited laterally and downward, but limited upward as to point of fixation to 15° above the horizontal.

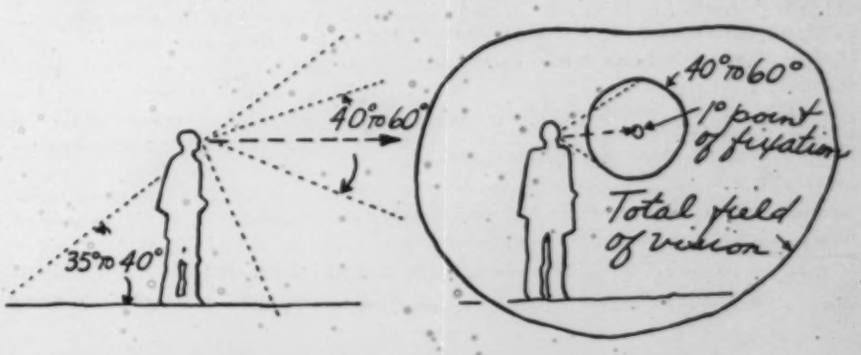
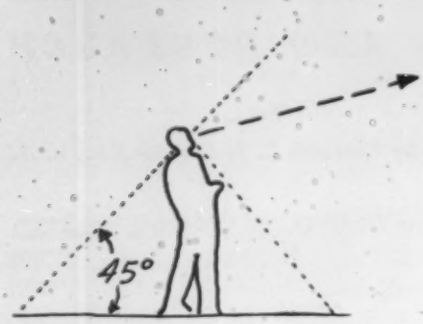


Fig. 1: Total field of vision extends about 80° to 90° to each side and below the central axis or line of horizontal fixed gaze, and 35° to 40° above it. Restricted upward angle is due to obstruction of the eyebrow. Immediate field of vision extends 40° to 60° about this axis. Within smaller cone concentrated gaze can move quickly and unconsciously

Fig. 2: An angle of 45° from horizontal is a safe cut-off angle when shielding light sources. It is natural to lower one's gaze, but less natural to look upwards much over 12° to 15° above horizontal



THE THREE A'S OF STORE LIGHTING

In a store, it's the merchandise that counts; and while the store as a whole should be pleasingly lighted, the first purpose of store lighting should be the *attraction* of attention to the merchandise, in regard to its relative importance, then to give the architectural interior a pleasing *appearance*, and finally to provide a light for the proper *appraisal* of merchandise. An understanding of these three A's of store lighting [1] — attraction, appearance, and appraisal — gives the architect-designer and illuminating engineer a better insight into the problems of store lighting.

ATTRACTION

The necessity of attracting attention is perhaps the one factor in store lighting that is relatively unimportant in most other lighting problems. This factor is the one in which the display and publicity manager and the individual charged with promotion are most interested. Attraction, of course, comes into play first from an exterior viewpoint. Most stores try to attract prospective customers into the store through the medium of display. Once they are inside, it is vitally important that their attention be attracted first to the merchandise on sale, especially the impulse items; second, to any messages or visual aids which are adjuncts to selling; and third, to the environment, which psychologically might help in the selling function.

Objects in the immediate field of vision attract attention almost directly in the degree that they are brighter than other objects and surfaces. This principle is known as "attraction through relative brightness." Practical application of this principle in a store is the job of the architect collaborating with the specialist in controlling light.

The merchandise itself, especially the impulse items, should be the brightest objects in what we have defined as the normal field of vision. The brightness of the merchandise depends upon two factors: first, the reflection value of the material or combination of materials in the merchandise (which the designer cannot control in a store); second, the degree to which the merchant in promoting his wares wants to attract more attention to some items than others. While the designer cannot control the reflection values of the merchandise, he can, in order to attract attention to materials of low-reflection value, design immediate backgrounds that have higher reflection values. This "immediate background" should not be confused with the architectural surfaces.

There should not, however, be too great a contrast between merchandise and immediate background or the primary objective of the third A, appraisal, will be impaired. With merchandise of basic materials with reflection factors as low as 10 per cent, such as a dark fabric bag, the background should not be over 35 to 40 per cent in reflection factor. This is sufficient with high levels of illumination to attract attention, and the dark merchandise can be better appraised, especially as to subtle color values, than would be possible with an immediate background double the brightness.

The type of merchandise that needs the highest over-all levels of lighting, as a rule, is that with a high impulse value and a high productivity of sales in relation to space and personnel. Many of the less productive items, such as home furnishings and other durable goods, do not require as high a brightness for selling.

Good lighting can also lower selling costs. Stores operate under varying peaks, a great many of their important sales coming at a time of considerable store congestion, which makes good service difficult. However, if satisfactory brightness on all displayed stock can be achieved, the customers, when they are not waited on immediately, can make certain pre-sale selections. This materially speeds up the consummation of the sale at the proper time.

A greater brightness on certain merchandise as compared with others fits in with the previously mentioned theory of "attraction through relative brightness." To attract attention an object must have double the brightness of its immediate surroundings. To be sure of attention, it should be at least three times as bright. Often it is desirable to attract attention to a display of merchandise which is sold in a less accessible part of the store. Again, it might be important to attract attention to a sample of a packaged item which from a profit standpoint must be sold in considerable quantities.

APPEARANCE

So far we have mainly discussed the brightness of the merchandise and its immediate background, but there is an area in the field of vision in most stores which is relatively greater than any other and the brightness of which, in relation to the merchandise, is of similar importance. This is the area devoted to the architectural environment. The brightness of this area has perhaps the greatest bearing on the matter of the second A, that of appearance, because the architectural environment in the field of vision is considerably greater than the area occupied by the merchandise, from a normal viewpoint, as shown by Fig. 3. The brightness of this larger area also has a decided bearing on the reduction of veiling glare on glass store fronts of open-front design. Lighting and the planned and controlled brightness values on architectural surfaces should be thought of as a design medium, just as the architect uses proportion, color, varying textures, rhythm, and the other skills at his command.

To summarize this matter of appearance and attraction, there are two basic types of brightness: first, that of the merchandise, some of which can have a relatively greater brightness depending upon the degree of attraction desired; and, second, the brightness of the architectural environment. Both utilize the known law that an object must have twice the brightness of its surroundings in order to attract attention. It is obvious, therefore, that key merchandise should be two to three times as bright as the remainder of the displayed stock and that the displayed stock or its immediate background should be two to three times as bright as the architectural surfaces.

APPRAISAL

In the matter of furnishing sufficient brightness and the correct quality of light on given merchandise in order to appraise it through the sense of sight, we have in the past thought only of two main categories of illumination. The first was general illumination and the second, a certain amount of plus lighting, generally in the form of shielded sources built into the showcase. If we created a brightness on the displayed stock in enclosed or recessed fixtures sufficient to attract attention, there still was an insufficient level of illumination for proper appraisal when the merchandise was taken out of the case for

[1] W. M. Potter: "Brightness Patterns that Sell Merchandise," MAGAZINE OF LIGHT, Issue No. 7, 1941. J. M. Ketchi "The Three A's of Store Lighting" — to be published shortly.

closer inspection by the customer.

This difficulty is overcome by introducing a new zone of illumination which can be called the "appraisal zone," or "selling light." When open stock is displayed horizontally, this selling light, of course, is also the display lighting. But even in the case of glass-enclosed stock (necessary with high-priced or easily pilfered merchandise), appraisal lighting should help the display lighting and furnish at least half of the light level within the display case. By this means, the plus lighting in the case, necessary to attract attention and reduce veiling glare on the enclosing glass, can be reduced considerably. For this purpose there are the new gaseous discharge lamps operated at lower wattages and brightnesses per foot. A benefit resulting from this reduction of lighting within the showcase is the accompanying reduction in heat and fading of merchandise.

In other words, there are two groups of areas of brightness and lighting; one static and always apparent from normal viewpoints, the architectural surfaces and displayed stock, and the other, which may or may not be static, the appraisal zone.

With certain merchandise having very low reflection factors, such as fabrics and furs, it obviously is difficult from an economic standpoint, considering also the matter of heat and comfort, to create general levels of illumination high enough to permit sufficient brightness for proper appraisal. It then becomes necessary to have limited appraisal zones of very high levels that are used for this purpose alone. In this event, care must be exercised with regard to the immediate background, which should have a low reflection factor so that it does not become a glare source and accordingly defeat the main objective of appraisal. With artificial lighting one has complete control of these locations from a plan standpoint as contrasted with the use of daylight, which is adaptable only to limited and fixed spaces.

In these strongly lighted appraisal areas, it is desirable to have sufficient over-all dispersed lighting on the architectural surfaces, or even a multiplicity of more direct sources, in order to soften what would otherwise be harsh shadows.

SELECTIVE AREAS FOR VARYING BRIGHTNESSES

Again entering into the economics of store lighting in certain studies we have made, it has been proved that for proper attraction of attention and for appraisal of merchandise, levels of illumination considerably higher than previously thought feasible are sometimes needed. Also discovered was the fact that, from a plan standpoint, the area in which we need these higher-level selling or appraisal zones is comparatively limited.

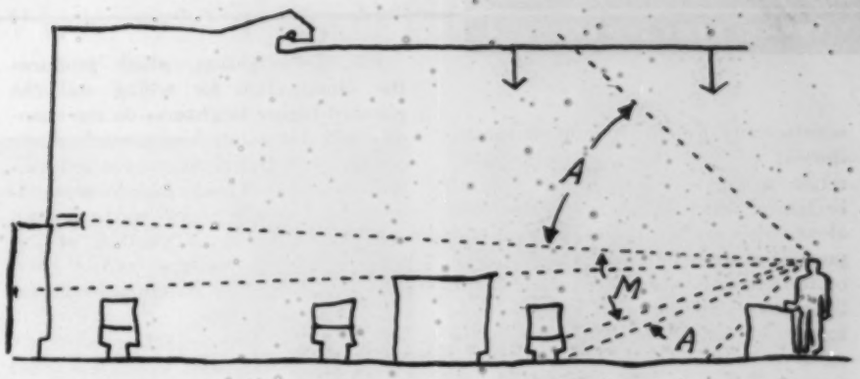


Fig. 3. From a normal viewpoint, the architectural environment of a store, shown within arcs A, occupies more of the total field of vision than do display areas, within arc M. Environmental lighting is important, therefore, from the standpoint of appearance

In analyzing floor areas, only 15 to 20 per cent of the total area in the plan is required for displayed stock or appraisal zones, as shown by the sketch in Fig. 4. Stippled areas are the only areas required for actual selling.

It is obvious that if this selling light can supplement the displayed stock illumination, we have not only produced economically the desirable high level for selling, but at the same time have utilized to the highest degree the principle of attraction through relative brightness. If the only illumination in the circulation areas is that produced as a result of environmental brightness, the merchandise will be many times brighter and will demand the attention of the customer, but not with the usual moonlight effect of most total downlighting installations.

COLOR OF LIGHT

As to the color of light, there is no single source commercially available that seems to be completely satisfactory as far as the illumination of certain merchandise and of the human complexion is concerned. The warm color of incandescent lighting is, of course, the most flattering to the skin, which is an important factor in apparel stores selling to women, so important, in fact, that many stores in this category are abandoning all types of fluorescent lighting except for purely decorative purposes. On the other hand, total incandescent lighting has its drawbacks from the standpoint of some merchandise.

It has been found in appraising samples of merchandise and materials that the coolness produced by indirect daylight fluorescent lamps, combined with incandescent sources, produces from the standpoint of spectral distribution the best results on complexion and merchandise when used within the limits of certain proportions.

It would be possible to use fluorescent sources, indirect or semi-indirect, shielded to 45° to 50° from the horizontal, and a daylight-type lamp of from 5500° K to 6500° K for brightness on architectural surfaces.[1] Decorative colors selected would have to be considered in relation to the fluorescent lamp. Reflected light from these surfaces would approximate light from a cool sky, when decorative colors are neutral or cool and with high reflection factors in the case of indirect lighting.

If the "selling light" and "feature display lighting" were incandescent sources of around 2800° K to 3000° K, their combined spectral distribution (in a ratio of from four to eight times the level of incandescent-direct to one of the fluorescent indirect) produces illumination pleasant in color and quality.

While these proportions obviously do not attempt to simulate all daylight conditions, the lower levels necessary in artificial illumination permit slight exaggeration of relative distributions in nature to produce a slightly more dramatic effect. Use of daylight fluorescent lamp with a reflected light similar to that of incandescent a little above 6000° K, reflected from flat white painted surfaces, creates bluer shadows from a single warmer incandescent source than ordinarily found in nature, and also the direct incandescent source of about 3000° K would approximate the warmer sun color of early morning. Accordingly the two together produce a greater relative contrast between cool and warm colors than found in nature. To eliminate shadows and distribute the illumination from direct sources, it is usually necessary to have two sources of light for a given area of appraisal. This reduces effect of coolness in shadows.

The absence of deep red in the fluorescent light is compensated for by the incandescent, and the emphasis on the blue and blue-purples of the mercury-filled fluorescent sources are toned down

[1] *The term "K" stands for "Kelvin" which is used to denote color temperature. 0° K equals 273° Centigrade on the temperature scale. The color value is that of a radiant body similar to a tungsten filament. Consequently as the K temperature increases, the color progresses from reddish-yellow to white to blue-white.*

satisfactorily by the amount of incandescent present. The blues, however, retain a great deal of their natural brilliance, which is lost in incandescent alone. Also, certain beiges and tans, so popular at times in apparel fabrics, take on too warm a color under incandescent light (as compared with average daylight) and completely lose their delicate color under fluorescent alone. We have found that a combination of the two types of lighting best eliminates this difficulty.

ATTRACTION THROUGH COLOR

Human beings like the warmth of sunlight. They dislike the cold atmosphere of an overcast sky. They will flock to the brightly lighted thoroughfares and shun the dark alleys. Consequently the brightness and color of the architectural environment and merchandise is important to the total effect.

There is a phase of "attraction" in the use of varied color sources. By establishing a greater and warmer brightness on merchandise, as compared to the lower and cooler brightness on main architectural surfaces, we have added one more element to our power to attract the customer's attention to the all-important merchandise.

There is a great deal more to the use of color in environment, and the psychology of color for selling various kinds of merchandise, but that is in the province of the display manager and interior decorator. The illuminating engineer, however, can be helpful in demonstrating the effect of various sources of illumination on various colors.

APPLICATION

The application of these principles is limited only by the combined ingenuity of the architect-designer and the illuminating engineer in creating brightness values on architectural surfaces. Fluorescent sources can be used totally indirect, or in a combination of indirect and down-lighting or semi-indirect sources. However, the source should be entirely concealed from normal viewpoints, shielded to 45°, or the enclosing equipment should have a planned brightness close to that of its surroundings, either by reflected light or, in the case of the semi-direct, by transmitted light. This is simply employing the principle of camouflage in concealing equipment.

RECOMMENDED BRIGHTNESS

Brightness on architectural surfaces can vary from 20 to 100 footlamberts or more to produce cool lighting at the display and selling level of as low as 3 or 4 footcandles up to 15 or more.

For down-lighting, which produces the illumination for selling and the planned higher brightness on merchandise and immediate backgrounds, there are many incandescent sources and controls available. These range from standard lamps of 100 to 500 watts in deep reflectors, with a 45° cut-off of the source, to reflector-lens control combination and inside aluminized reflector PAR type spotlights.

In the past, louvers, acting as shields, have had a brightness which was quite distracting. Often such louvers, which are always lighted, can be finished a dull black. Considering the importance of this type of light and the necessity of careful control from an economic standpoint, the limited area to be covered, and the horizontal shapes of these areas (see Fig. 4), there might be a new lighting tool developed in the form of a mass-produced spot, using an integrated-lens type of lamp. This would give an asymmetrical distribution of light so that, from a distance of 12 to 16 ft., rectangular areas of useful light, approximately 3 by 9 ft., can be produced. These spots could be placed singly or in combination in recessed boxes, completely adjustable so that they could be directed in any direction. Naturally they would be placed so that the direct source was always concealed from normal viewpoints, and the visible equipment would be so designed, constructed, painted, or surfaced that its brightness would be similar to that of the immediate surroundings. The lights should overlap to prevent too much shadow casting.

In installations where new ceilings are possible, plenum chambers might be created so that the heat from the selling light or even that created by the auxiliaries in certain fluorescent installations might be exhausted without reaching the selling space. This selling light should produce from 25 footcandles up to 100 footcandles in the selling zones, producing a brightness on the merchandise or immediate surroundings, depending on the reflection factor involved, of from as low as 5 to 20 footlamberts up to as high as 200 footlamberts on featured displays. These light levels of course have to be added to the levels produced by the environmental lighting. One hundred footcandles is about the threshold of sensitivity to radiant heat felt on the back of the hand in selling or demonstration zones.

In stock, which is displayed in enclosed fixtures, a certain amount of plus lighting is desirable to create an increased brightness to compensate for shadows or reduced transmission, and eliminate veiling glare in the case of glass-enclosed showcases. This plus lighting in itself should produce from 25 to 75 footlamberts with levels of from possibly 50 to 200 footcandles.

MIRROR LIGHTING

In mirror lighting, with its comparatively fixed viewpoint, it is important to use the same techniques that one would use in colored portrait photography. Controlled light sources can be reflected into the mirror and back upon the subject. It is possible with a fixed viewpoint to control the lighting almost completely, especially in fitting rooms or special-selling alcoves. For example, one can employ any desired color of what is called a fill-in light to create illumination within the shadows; then a comparatively low intensity from a confined source of warm light can be directed to the face. High-level side lighting can be confined directly to the garment, particularly in departments for items such as coats and furs. In the case of triple mirrors, such lighting can be reflected from the wing mirrors. Top down-lighting of high intensity can also be used effectively in confined selling spaces such as fitting rooms. The reflection factor, color, and illumination of the background are all important in mirror lighting.

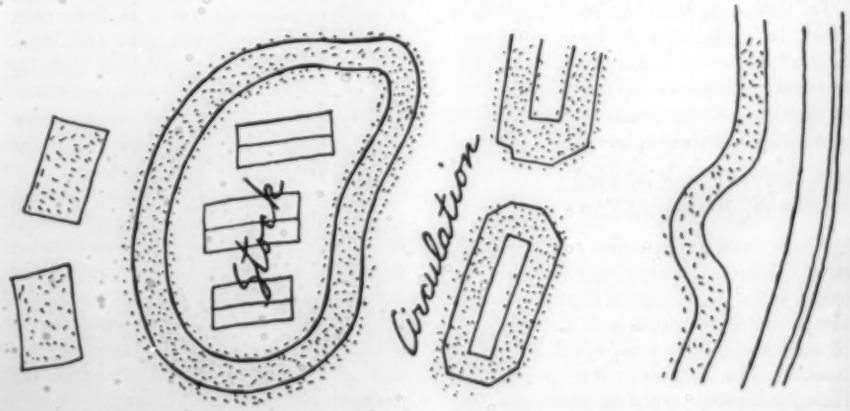


Fig. 4: Only about 15 to 20 per cent of highly productive store areas, shown by stippling, is occupied by displayed stock and appraisal zones that require added brightness

42,000 PILES DRIVEN ON PROJECT

Old, hidden foundations of demolished gas tanks necessitated special pile-driving operations at Stuyvesant Town site. Beneath broken stone rip-rap lies concrete floor, 2 ft. thick

FOUNDATIONS for Stuyvesant Town, Metropolitan Life's 75-acre housing project in New York City, called for the driving of 42,000 piles over an area from which obsolete buildings covering 18 city blocks had been razed.

Pile-driving conditions are difficult due to the nature of the site, which is land reclaimed from the East River over a period of many years; built up slowly by a process of extending box-cribs filled with rocks into the stream. The land, therefore, contains rock slabs, many over a cubic yard in volume, timbers 18 in. sq. in cross section, and accumulated layers of fine sand and silt.

This was thought to be the summation of the pile-driving problem; customary test borings having been made at the start, and no other conditions encountered. Soon after operations started, however, engineers made an unwelcome discovery, which tangled further an already knotty problem.

Old, hidden foundations for an extensive gas storage area were uncovered. These consisted of six foundations, 100 ft. in diameter, with interlocking brick walls forming the sides, and with floors of solid concrete, 2 ft. thick. Three of the foundations had been filled with broken stone rip-rap to the level of the side walls. Investigation later turned up two more of these foundations, all a part of the gas storage area which had been cleared, filled in, and forgotten, probably in the 1880's.

Since pile supports with known bearing capacity had to be provided throughout the area, some means was necessary for driving through the concrete foundations. The alternative of removing enormous quantities of concrete would have proved ruinously costly.

Construction engineers were, therefore, faced with two types of pile-driving conditions: one, of driving piles through the boulder-filled box-crib areas of reclaimed land; and, two, the even more difficult one of breaking through concrete foundations and rip-rap of the old storage areas. For the first, a pre-cast "concrete button" pile point was used; for the second, the concrete button was replaced by a steel plate or spud. Both are illustrated in the sketch below.

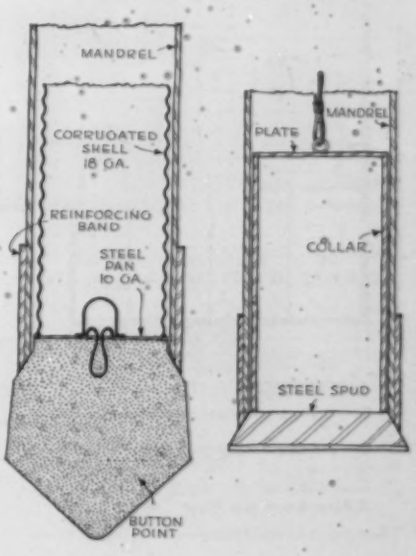
CONCRETE PILE POINT

The contractor who did the job, Western Concrete Pile Corporation, had developed a "button bottom" pile point of pre-cast concrete, which proved most effective for the rock-fill area. As a result of its material and design, the concrete button, although unreinforced, is more resistant to stresses than any reinforced button yet produced. A 5-ton driving hammer was used. Buttons are produced in a casting plant on the site; and, because of their high early strength, can be used within 72 hours of casting.

STEEL SPUD

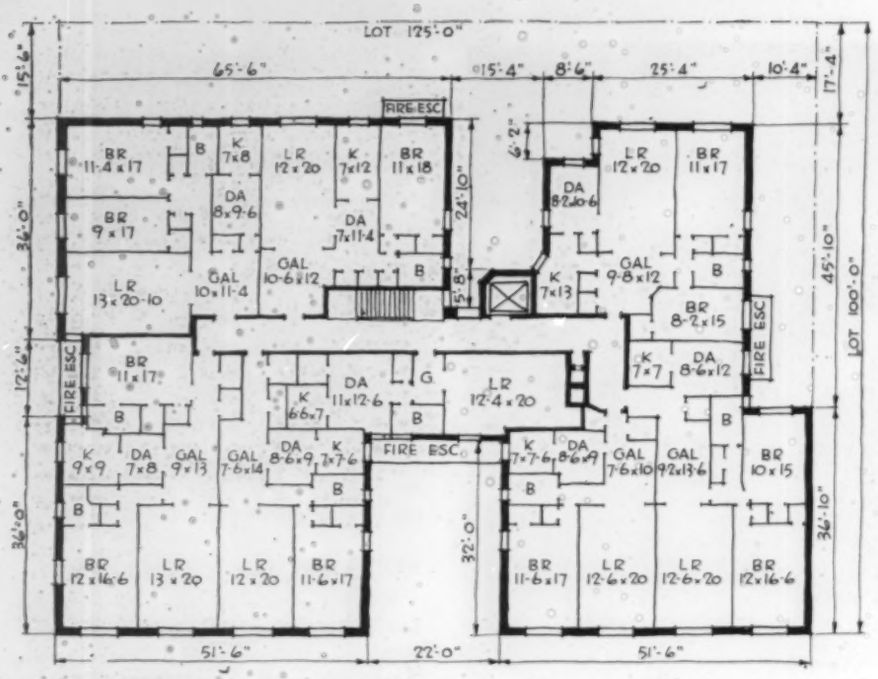
Whenever one of the old concrete foundations was encountered, the concrete point was replaced by a steel spud, 3 in. thick, welded to a collar which fits within the mandrel. After the spud has broken through concrete foundations and rip-rap, mandrel and spud are withdrawn and operations resumed with a concrete button replacing the spud. When bearing is reached, the concrete button is left in place and a spirally-corrugated cylindrical shell is attached to its top face, to be filled with concrete. In order to prevent pressure from nearby pile-driving operations crushing the shell before filling, shells are stiffened temporarily by the insertion of a section of 10-in. pipe, later removed.

Seven pile drivers on the site are averaging a button driven every 15 minutes, and the entire casting and pile-driving procedure has been developed into a routine cycle of operations.



Left: "Concrete button" pile-points of this type were used to drive 42,000 piles. High early strength of concrete permits use within 72 hours of casting on the site. Button is a pointed concrete drum, unreinforced, which fits inside mandrel that has been machined to fit sloping shoulder of button. Steel band acts as reinforcement, directing stresses inward toward core. After bearing is reached, button is left in place as permanent footing. Clip engages bottom plate of shell to be filled with concrete. Right: Steel spud replaced concrete pile point when old concrete foundations were encountered. Welded collar fits within mandrel. Cable permits the raising and reuse of spud

FIRE-SAFE APARTMENT HOUSES

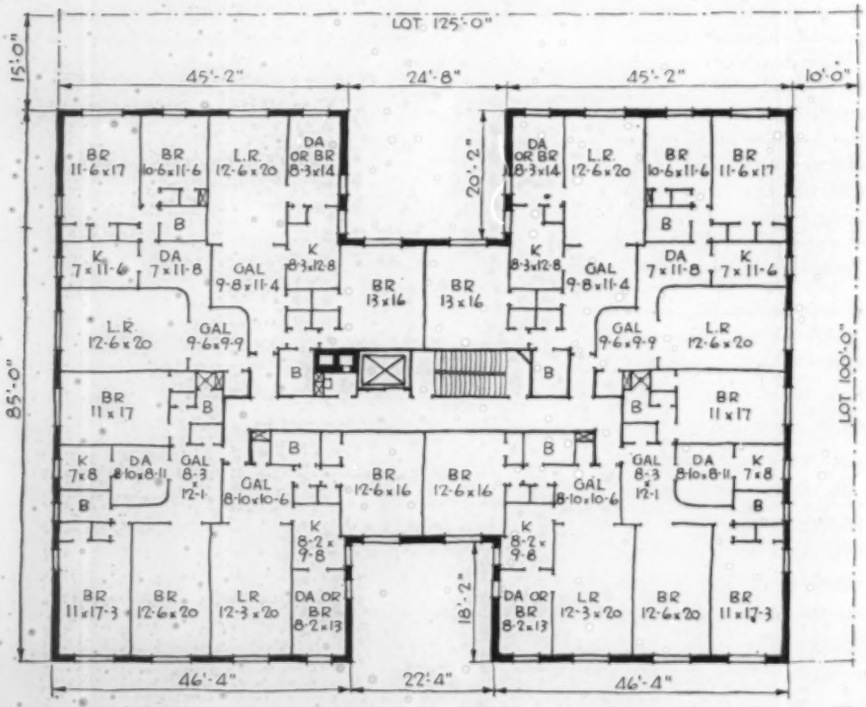


NON-FIRE-RESISTIVE: Typical Floor Plan, 6-Story Apartment, 71% of Lot Occupied

Apartment Schedule

3	4-Room Apartments	= 12	Rooms
1	3½- " "	= 3½	"
3	3- " "	= 9	"
1	2- " "	= 2	"
8 Apartments per Floor		= 26½	Rooms

5 Floors with 8 Apartments and 26½ Rooms
1st Floor with 7 Apartments and 25 Rooms
Total 47 Apartments and 157½ Rooms *



FIRE-RESISTIVE: Typical Floor Plan, 6-Story Apartment, 71% of Lot Occupied

Apartment Schedule

2	4-Room Apartments	= 8	Rooms
6	3½- " "	= 21	"
8 Apartments per Floor		= 29	Rooms

5 Floors with 8 Apartments and 29 Rooms
1st Floor with 8 Apartments and 26 Rooms
Total 48 Apartments and 171 Rooms *

* Supt. Apt. 4 Rooms Additional.

MORE rooms and more rent result from fire-resistive construction in apartment houses, according to a recent study which points out the economic advantages of this type of construction, over and above the usual social advantages of fire safety. Findings were published, by American Iron and Steel Institute, American Institute of Steel Construction, and Steel Joint Institute, regarding comparative building costs of fire-resistive and non-fire-resistive apartment houses in New York City. The study was made in support of the Desmond Bill, introduced in the 1945 session of the New York State Legislature to require that all multiple dwellings over three stories high be built of fire-resistive construction in New York City, and specifically to refute charges that such construction would boost costs from 30 to 40 per cent.

The scope of the investigation was confined to comparing costs of the two types of construction for theoretical dwellings, six stories high. First step was to determine representative plots of land on which such dwellings might be erected today. Since no single plot or layout could be truly representative for all of New York City, it was necessary to consider typical plots in the three boroughs of Manhattan, the Bronx and Queens.

Two architects identified with apartment house planning, H. I. Feldman and Andrew J. Thomas, were retained by the committee, and asked to prepare plans for buildings of fire-resistive and non-fire-resistive construction for each of these plots in conformity with New York State Multiple Dwelling Law and Building Laws of New York City. Mr. Feldman prepared plans for both fire-resistive and non-fire-resistive construction for each site. Mr. Thomas developed plans for a garden-type layout in Queens, independently and in addition to layouts prepared by Mr. Feldman. Prewar 1939 prices were thought to provide the fairest basis for comparison. Complete cost analyses and itemized estimates were prepared.

Included on these pages, for the purpose of comparison, are rental plans and estimated construction costs (based on 1939 prices) developed for one of the sites, a corner lot in the Bronx, 125 ft. by 100 ft. Similar findings were published for Manhattan and Queens.

INCREASE IN RENTABLE ROOMS

Since fewer fire wall subdivisions are required in fire-resistive construction, there is greater freedom in planning and a resulting increase in usable and rentable space. Building laws permit interior baths and inside halls and stairs in six-

PAY DIVIDENDS

story multiple dwellings of this construction. Additional space with outside exposure, therefore, can be developed into desirable rental areas. Room sizes are increased through use of 2-in. fire-resistive partitions instead of 5-in. plaster and wood stud partitions.

The following economical advantages of fire-resistive construction were announced: (1) greater rental income is derived from fire-resistive buildings; (2) cost per rentable room is generally lower by amounts ranging up to 6.3 per cent, while gain in number of rentable rooms averages 8.6 per cent at an average added building cost of 5.1 per cent; (3) increase in rental income obtainable from more rentable rooms averages 7.1 per cent, which, when capitalized conservatively, covers any increase in initial building costs and warrants higher loan values; (4) increase in initial building cost may be recovered out of increased rental income within first 2.2 to 7.6 years; (5) lower depreciation and insurance rates, and prolonged amortization result.

MEANING OF "FIRE-RESISTIVE"

The term "fire-resistive construction" as used throughout the report denotes buildings employing only non-combustible structural elements which satisfy the fire-resistive and other requirements prescribed for multiple dwellings, both by present Multiple Dwelling Law of New York State and Building Laws of N. Y. C., as shown below.

FIRE RESISTANCE REQUIREMENTS
(6-Story Multiple Dwellings)

	Fire-Resistive	*Non-Fire-Resistive*
Exterior Walls	3 hr.	3 hr.
Stairway Enclosures	3 hr.	3 hr.-Bearing (e) 2 hr.-Non-Bearing (e)
First Floor	3 hr.	3 hr.
Other Floors	1½ hr.	N.R. (a)
Roof	1½ hr.	N.R.
Protection of Interior Columns	2 hr.	N.R.
Partitions Enclosing Public Halls	3 hr. (d)	3 hr.-Bearing (e) 2 hr.-Non-Bearing (e)
Other Partitions	1 hr. (b)	N.R. (c)

N.R. No fire-resistance requirement.

(a) N. Y. State Multiple Dwelling Law requires 3-hour fire-resistance for floors in corridors and public halls.

(b) Between apartments solid metal lath and plaster partitions 2½ in. thick or equivalent may be used (New York City).

(c) N. Y. State Multiple Dwelling Law has special requirements for fire-stopping of partitions between apartments (Sec. 152).

(d) N. Y. State Multiple Dwelling Law requirement is 3 hours. N. Y. City Building Law requirement is 1 hour.

(e) N. Y. State Multiple Dwelling Law requirement is 3 hours for bearing and 1 hour for non-bearing enclosure wall; N. Y. City Building Law requirement is 2 hours irrespective of whether bearing or non-bearing wall.

ESTIMATE OF COMPARATIVE COSTS (1939 PRICES)
For Six-story Bronx Apartment House

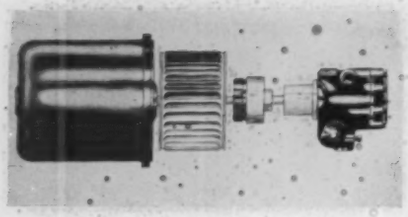
	Non-Fire-Resistive	*Fire-Resistive*
CONSTRUCTION COST (Building Cost and Job Expense)	$192,456	$202,124
GENERAL EXPENSE (Taxes, Interest, Finance Charges, Fees)	18,215	18,965
Total Cost	*$210,671*	*$221,089*
Cost Per Cubic Foot	$0.339	$0.361
Total Number of Rentable Rooms	157½	171
Cost Per Rentable Room	$1,338	$1,293

ITEMIZED ESTIMATE OF COMPARATIVE COSTS (1939 PRICES)

BUILDING COST	*Non-Fire-Resistive*		*Fire-Resistive*
Excavation	$4,887		$5,069
Concrete Work	12,427		20,083
Masonry	35,646		28,714
Structural Steel	8,096		13,452
Steel Joists	—		7,491
Carpentry	38,846		28,026
Plastering	23,228		29,387
Plumbing	12,000		12,250
Heating	8,880		9,065
Oil Burner	1,900		1,900
Electrical Work	7,690		9,048
Elevator	5,000		5,000
Painting	6,460		7,000
Miscellaneous Iron	3,360		270
Roofing & Sheet Metal	2,317		1,964
Tile Work	5,741		6,364
Terrazzo Work	758		404
Finish Hardware	1,544		1,675
Bathroom Ventilation	—		827
Miscellaneous	6,295		6,639
Total	*$185,075*		*$194,628*
JOB EXPENSE			
Superintendent (26 weeks @ $100)	$2,600		$2,600
3 Laborers ($40 per week each for 17 weeks)	2,040		2,040
Watchman (26 weeks @ $20)	520		520
Water (.002 x $185,075)	370	(.002 x $194,628)	389
Cleaning (.0025 x $185,075)	463	(.0025 x $194,628)	487
Removal of Rubbish (.00375 x $185,075)	694	(.00375 x $194,628)	730
Fire Insurance (.00375 x $185,075)	694	(.00375 x $194,628)	730
SUBTOTAL	$7,381		$7,496
Total Building Cost and Job Expense	*$192,456*		*$202,124*
GENERAL EXPENSE			
Taxes During Construction	$1,500		$1,500
Interest During Construction	1,800		1,800
Interest on Building Loan During Construction (1¼% of $192,456)	2,406	(1¼% of $202,124)	2,527
Finance Charges (2½% of $192,456)	4,811	(2½% of $202,124)	5,053
Architect and Supervision (4% of $192,456)	7,698	(4% of $202,124)	8,085
SUBTOTAL	$18,215		$18,965
Total Cost	*$210,671*		*$221,089*

Non-Fire-Resistive	*Fire-Resistive*
622,100 cu. ft. @ $0.339 = $210,671	612,947 cu. ft. @ $0.361 = $221,089
161½ Rooms @ $1,304 = $210,671	175 Rooms @ $1,263 = $221,089
4 Deduct Superintendent's Apartment	4 Deduct Superintendent's Apartment
157½ Rentable Rooms @ $1,338 Per Room = $210,671	171 Rentable Rooms @ $1,293 Per Room = $221,089

PRODUCTS for Better Building



New fuel-saving clutch for oil burner

OIL BURNER

Fuel savings of from 10 to 24 per cent are reported in test installations of a new oil burner equipped with an automatic *Economy Clutch*.

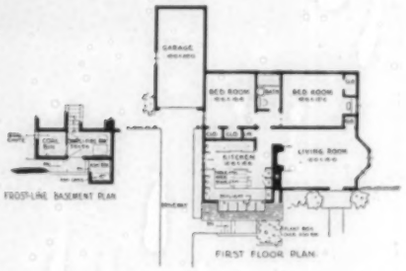
The clutch, which operates by centrifugal force, is designed to eliminate the heavy deposits of soot and smoke which can rob home oil-heating plants of considerable efficiency. This it accomplishes by delaying operation of the fuel pump until the fan is delivering enough air for complete and even combustion when the burner is turned on, and by continuing the fan action for several seconds after the flame has ceased when the burner is turned off.

The new burner was designed and developed by engineers of Gilbert & Barker. For more than two years it has been under exhaustive tests by the Esso Laboratories as well as by its makers. The unit will be distributed and sold with the Esso label in the 18 eastern and southern states comprising the Esso territory, and will be marketed elsewhere as the *Gilbarco* burner. Gilbert & Barker Mfg. Co., West Springfield, Mass.

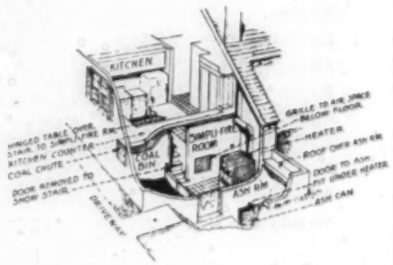
Minimum house, maximum heating comfort

SIMPLE HEATING

Featured in the six "Answer Homes" designed by Randolph Evans for the Anthracite Institute, the second of which is pictured above, is the *Simpli-Fire Room*. This novel arrangement of furnace room, designed to give the greatest comfort and convenience possible with either hand-fired or automatic coal burning equipment while reducing the cost of the house, is a small addition to the front of the building. Ash shoveling is eliminated by an arrangement which permits withdrawal of the ashes from outside the house. Grilles allow the natural escaped heat from furnace or boiler to circulate in the space between floors and ground level, providing warm floors without a full basement.



Floor plan, above, and section of service wing, below, Anthracite Institute house



THERMOSTAT

A completely automatic thermostat, the *Chronotherm*, is simple in external and interior design, with no intricate mechanism to cause trouble. External temperature adjustments allow instantaneous setting for day and night temperatures at any desired level.

The new thermostat is a completely new instrument, taking only its name from its prewar predecessor. It makes use of a new-type bimetal element developed for the instrument to assure accurate temperature control, and through an additional electrical mechanism, prevents overshooting the daytime temperature setting during the morning pickup. The clock is of the self-starting type, employing a low-speed motor to eliminate noise, and can be adjusted as easily as a watch by means of an external fingertip wheel. A new convenience permits easily adjusted temperatures down to as low as 50° while occupants of a home are away for a weekend or longer.

Because of current material shortages and the demand for the company's standard products, the new Chronotherm is not scheduled for production until early 1947. Minneapolis-Honeywell Regulator Co., 2600 Fourth Ave. South, Minneapolis 8, Minn.

More powerful radiant baseboard unit

BASEBOARD HEATING

To provide baseboard heating for large areas, or for rooms in which baseboard space is at a minimum, the *Hy-Power Base-Ray Radiant Baseboard* has been developed. Like the standard model, the Hy-Power operates on any hot water, two-pipe steam or vacuum system, and can be used in either new construction or remodeling, requiring no structural changes.

The more powerful unit delivers approximately 60 per cent more heat than the standard model, the greater output achieved by means of vertical fins on the back of the unit. It is almost the same size as the standard: 7 in. high and 2 in. thick; an ordinary wood molding, to complete the effect of a baseboard, is installed at the top of the unit. Burnham Boiler Corp., Irvington, N. Y.

Ventilating fan designed for thin walls

VENTILATOR

To accommodate homes with thin-wall construction, the *Ilgvent 8-in. Package-Type* electric ventilating fan is now available with a 3⅜ in. sleeve for mounting in thin walls. It is said to be suitable also for installation in a steel sash or other small panel window, with the unit replacing one pane of glass.

The fan unit is mounted in a steel panel with sleeve extending through the wall. Electrical connection can be made from a circuit in the wall or with an extension cord to a nearby electrical outlet. A pull chain is used to open or close the weather-tight outer door, simultaneously starting or stopping operation of the fan. The unit will provide a two-minute air change in kitchens up to 700 cu. ft. in area. Ilg Electric Ventilating Co., Chicago, Ill.

(*Continued on page 142*)

MANUFACTURERS' LITERATURE

BOILERS

Vertical Fire-Tube Boilers. Folder describing a line of full-length and submerged fire-tube boilers ranging in capacity from 3 to 110 h.p. Specifications tables included. 4 pp., illus. The Brownell Co., Dayton 1, Ohio.

BURNERS

Precision Combustion. Complete data on a line of industrial conversion burners, illustrating the main features and offering operation charts to show their advantages. Illustrates also the different types of boilers with which the burner may be used. Includes two typical oil piping diagrams. Bulletin ID-46-6, York-Shipley, Inc., York, Pa.*

CLAY PRODUCTS

Claycraft Clay Products. A catalog of glazed brick and tile, unglazed facing brick and tile, shale face brick, floor brick, etc. Gives color ranges and sizes, illustrates textures. 8 pp., illus. The Claycraft Co., Columbus 16, Ohio.*

COLD STORAGE

Eagle-Picher Insulation for Low Temperature and Cold Storage Application. Instruction manual containing factual presentation of the use of mineral wool for all types of cold storage and low temperature installations. Explains importance of the vapor barrier, gives installation details, and includes tables of proper storage temperature and humidity and thermal conductivity of various materials. 28 pp., illus. The Eagle-Picher Co., Dept. CSM, American Bldg., Cincinnati 1, Ohio.*

DOOR CLOSERS

L.C.N. Door Closers. Full information and specifications on a line of concealed and exposed door closers. Features a door closer selector to facilitate selection. Gives detailed information about parts, installation and operation. 34 pp., illus. L.C.N., 466 W. Superior St., Chicago 10, Ill.

DOORS, TRIM

Hollow Metal. A new catalog of practical information on elevator enclosures, hollow metal doors, interior trim, office partitions, cold rolled mouldings, custom fabrications. Written especially for architects. 64 pp., illus. Dept. R-1, Jamestown Metal Corp., 104 Blackstone Ave., Jamestown, N. Y.*

DRAWING AID

Pomeroy Stereograph. Descriptive folder explaining the use of a drawing machine to illustrate any object in the third dimension. Diagrams and full description of mechanics and method of use. 4 pp., illus. Pomeroy Stereograph Co., Inc., 314 Empire Bldg., Cleveland, Ohio.

FLOOR MACHINE

Tenant Model 15 Disc Type Floor Machine. Bulletin describing a new model featuring low motor carriage and addition of side polishing brush. Includes specifications, advantages claimed. 2 pp., illus. G. H. Tennant Co., 2530 2nd St. North, Minneapolis 11, Minn.

GLASS PIPE

Pyrex Brand Glass Pipe for the Food Industry and **Pyrex Brand Glass Pipe for the Process Industries.** Information on glass pipe lines, sizes and accessories available, advantages claimed. 4 pp. each, illus. Industrial Sales Dept., Corning Glass Works, Corning, N. Y.*

HARDWARE

Hardware for Casement Windows. Catalog of casement window operators and accessory hardware covering entire line of internal and external operators for both metal and wood casement sash. Includes installation drawings and complete specifications. 8 pp., illus. H. S. Getty & Co., Inc., 3206 N. 10th St., Philadelphia 40, Pa.*

HEATING

Crane Plumbing and Heating for Low Cost Homes. Catalog of bathroom, kitchen, laundry and heating equipment, giving full descriptions and specifications. 20 pp., illus. Crane Co., 836 S. Michigan Ave., Chicago 5, Ill.

Radiant Heating. Covers the use of copper tube in radiant heating systems, discusses the history and development of radiant heating and enumerates some of the advantages claimed for it. Illustrates typical installations. 20 pp., illus. Copper & Brass Research Assn., 420 Lexington Ave., New York, N. Y.

LIGHTING

Arches of Light for Modern Schoolrooms. Ideas by E. Post Tooker, A.I.A., on good school lighting. Diagrams and suggested schemes for the principal's office, the classroom, the auditorium and the laboratory. 12 pp., illus. General Electric Lamp Dept., Nela Park, Cleveland 12, Ohio.*

Fluorescent Lamps. Basic principles and operating characteristics of fluorescent lamps and auxiliaries. Explains, with sketches and diagrams, the construction and function of ballasts, starters and lampholders. Gives mortality and replacement rate curves. Booklet A-4759, Westinghouse Lamp Division, Advertising and Sales Promotion Dept., Bloomfield, N. Y.*

Over-all Lighting by Wakefield. Catalog of various types of lighting fixtures with detailed drawing of each and specifications. Gives general lighting design data, tables of utilization factors, information on fluorescent lighting, performance tables, etc. 40 pp., illus. Catalog 46, The F. W. Wakefield Brass Co., Vermilion, Ohio.*

Remodeling with Light to Streamline Office Space. Diagrams and descriptions of lighting suggestions for the executive office, general office and conference room by J. Gordon Carr, A.I.A. 12 pp., illus. General Electric Lamp Dept., Nela Park, Cleveland 12, Ohio.*

METAL LATH

Penmetal Lath and Plastering Accessories. Catalog of various types of metal lath, clips, furring mails, channel iron, corner head, metal lath accessories, steel studs, etc. Includes engineering data and specifications. 20 pp., illus. Penn Metal Co., Inc., 40 Central St., Boston 9, Mass.*

METAL MESHES

Expanded Metal Meshes. Sizes, dimensions and weights of standard and flattened steel meshes. Uses of steel mesh. 8 pp., illus. Penn Metal Co., Inc., 40 Central St., Boston 9, Mass.*

PLASTICS

Plexiglas Sheets, Rods and Molding Powders. A resumé of Plexiglas applications and characteristics, including a paragraph on applications in the home building field. 8 pp., illus. Rohm & Haas Co., Philadelphia, Pa.

Textolite Decorative Surfacing Materials for Table and Counter Tops. Booklet presenting 18 different patterns of decorative surfacing materials of Textolite for table and counter tops. Advantages claimed, properties, sizes, grades, ordering instructions. 12 pp., illus. Chemical Dept., General Electric Co., Pittsfield, Mass.*

RETAINING WALLS

Penmetal Copper Alloy Areawalls. Bulletin on retaining walls for basement window areaways. Gives tables of standard sizes for both the round and the straight type, installation details, ordering information. 4 pp., illus. Penn Metal Co., Inc., 40 Central St., Boston 9, Mass.*

STALL ENCLOSURES

Sanymetal Toilet Compartments. Porcelain enamel wainscoting and partitions to achieve colorful, sanitary toilet

(*Continued on page 148*)

*Other product information in Sweet's File, 1946.

AREA CHARTS FOR ACUTE GENERAL HOSPITALS

Recommendation of Hospital Facilities Section,

U. S. Public Health Service

THE areas shown are intended as suggested space assignments for the various activities in a general hospital set up with service and accommodations for surgery, obstetrics, medicine, pediatrics, and emergency care.

Due to the wide variation in demand there are no provisions made for, (1) out-patient department, (2) quarters for personnel, including interns on residents, (3) nursing school or any other teaching affiliation, (4) storage space for fuel, or (5) garage. If any of these functions or activities are contemplated, additional space must be added to the areas given in the tables. The areas given are intended as basic areas for the functions and activities detailed in the accompanying discussion, and may be added to, increased

(*Continued on page 131*)

AREA DISTRIBUTION FOR ACUTE GENERAL HOSPITALS OF CAPACITIES SHOWN

Areas in Sq. Ft.	50-Bed		100-Bed		150-Bed		200-Bed	
	Total	*Per Bed*	*Total*	*Per Bed*	*Total*	*Per Bed*	*Total*	*Per Bed*
Administration Department	1,970	39.4	2,975	29.8	3,577	23.8	4,775	23.8
Adjunct Diagnostic and Treatment Facilities								
Pathology	560	11.2	1,140	11.4	1,440	9.6	1,617	8.1
Radiology	565	11.3	565	5.7	1,080	7.2	1,285	6.4
X-Ray Therapy	—	—	—	—	—	—	1,775	8.8
Physical Therapy	520	10.2	820	8.2	1,020	6.8	1,215	6.1
Occupational Therapy	—	—	—	—	400	2.6	495	2.5
Pharmacy	205	4.1	410	4.1	600	4.0	730	3.7
Nursing Department	8,805	176.0	17,995	179.9	26,995	179.9	35,995	179.9
Nursery	500	10.0	835	8.4	1,205	8.0	1,640	8.2
Surgical Department	1,980	39.6	3,105	31.1	4,210	28.1	5,030	25.1
Obstetrics Department	1,175	23.5	1,505	15.1	1,905	12.7	2,110	10.6
Emergency Department	370	7.4	370	3.7	515	3.4	775	3.9
Service Department								
Dietary Facilities	2,145	42.9	3,070	30.7	3,770	25.1	5,035	25.2
Central Storage	1,175	23.5	2,240	22.4	3,330	22.2	4,390	21.9
Employees Facilities	765	15.3	1,215	12.2	1,595	10.6	1,895	9.9
Laundry and Housekeeping	1,365	27.3	1,805	18.1	2,325	15.5	2,715	13.6
Mechanical Facilities	1,030	20.6	1,480	14.8	1,800	12.0	1,970	9.9
Circulation Spaces	8,010	160.2	13,705	137.1	20,285	135.2	26,875	134.4
Total	31,140	623.0	53,235	532.4	76,050	507.0	100,322	501.6

LOVELY to look at, that cake. But how good it tastes depends on what went into the *recipe*.

With building products, too, it's what's *inside* that decides their quality of performance. That's why so many people insist on Celotex Building and Insulating Products.

For the raw materials that go into Celotex are the best that nature can grow and money can buy.

Rigid production controls all along the line guarantee uniformly high quality of every product bearing the Celotex name.

Tireless laboratory research perfects materials and methods still *more*... helps to maintain Celotex leadership year after year.

These—plus more than a quarter of a century of building materials "know-how"—are the invaluable ingredients in every Celotex product.

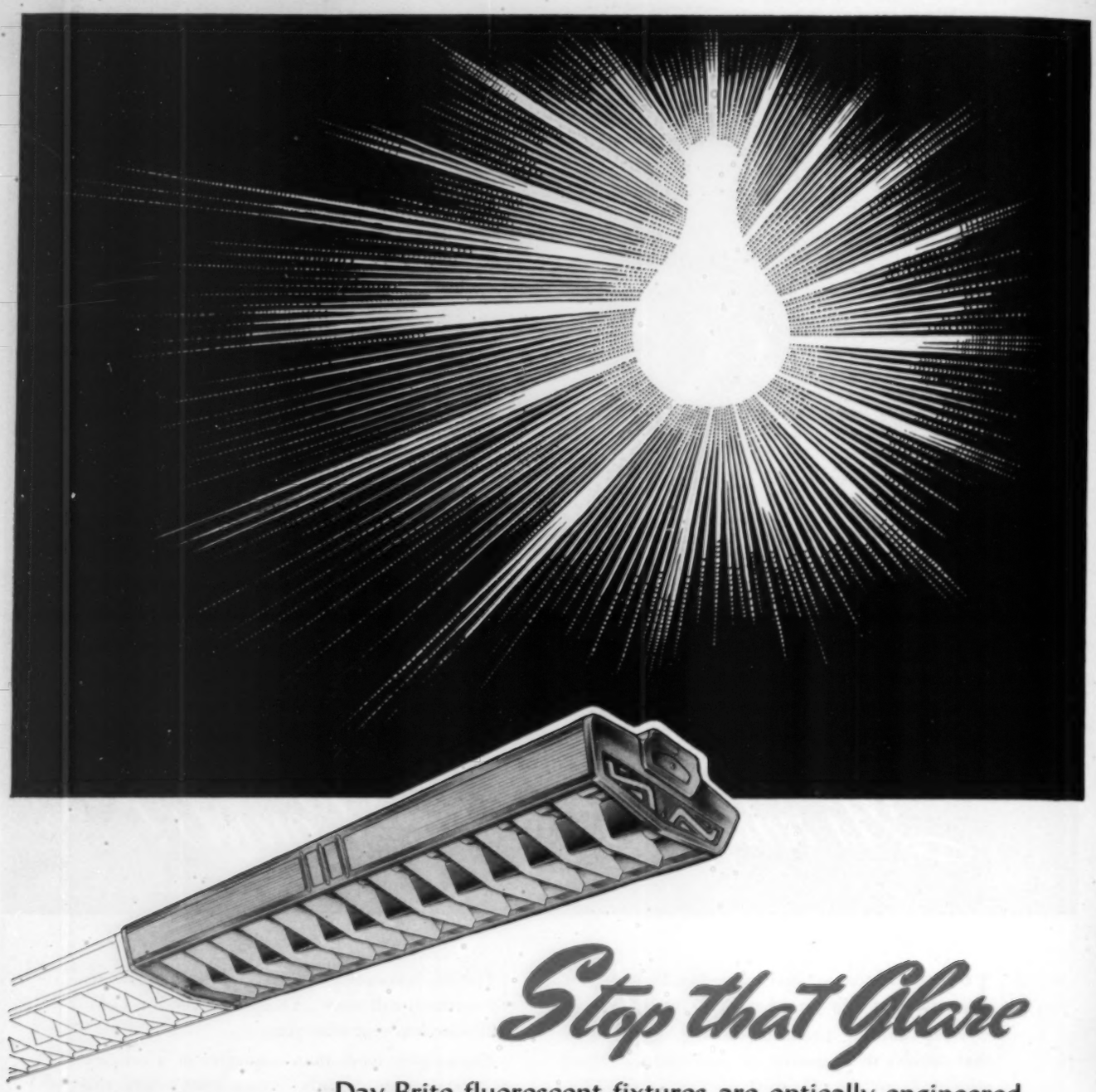
They make a big difference in performance... in long life and service-free maintenance. A difference that has proved its value on hundreds of thousands of building jobs of every kind.

There aren't enough of these famous Celotex products to go around *now*—but rest assured as soon as building products generally become available, you'll be able to get all the Celotex you need.

Building Board — Celo-Rok Sheating and Wallboard
Interior Finish Boards — Celo-Rok Lath and Plaster
Cemesto — Rock Wool Insulation
Triple Sealed Shingles

CELOTEX
REG. U.S. PAT. OFF.
BUILDING PRODUCTS

THE CELOTEX CORPORATION • CHICAGO 3, ILLINOIS



Stop that Glare

Day-Brite fluorescent fixtures are optically engineered to make seeing comfortable... In the VIZ-AID, patented V-shaped ALZAK louvres evenly distribute glareless light.

The VIZ-AID

For ceiling or suspension mounting—unit or continuous installation. Designed for two 40-watt lamps. U. S. Patent Nos. D-138990, D-143641 —others pending.

Day-Brite Lighting, Inc., 5465 Bulwer Avenue, St. Louis 7, Mo.

Nationally distributed through leading electrical supply houses.

In Canada: address all inquiries to Amalgamated Electric Corp., Ltd., Toronto 6 Ont.

13

IT'S EASY TO SEE WHEN IT'S

DAY-BRITE *Lighting*

AREA CHARTS FOR ACUTE GENERAL HOSPITALS

(Continued from page 126)

Areas in Sq. Ft.	50-Bed	100-Bed	150-Bed	200-Bed
ADMINISTRATION DEPARTMENT				
ADMINISTRATION				
Main lobby and waiting room	465	520	675	865
Retiring room	—	110	110	110
Public toilets	130 (2)	130 (2)	130 (2)	210 (2)
Public telephone(s)	10 (1)	20 (2)	20 (2)	20 (2)
Admitting office	115	175	175	175
Social service	—	180	200	285
Information and telephone	45	80	80	90
Administrator	180	240	240	285
Secretary	115	115	115	140
Business office(s)	285	450	625	805
Personnel toilets	90 (2)	130 (2)	175 (2)	215 (2)
Record room	180	240	400	510
Director of nursing	130	130	130	215
Assistant director of nursing	—	—	—	215
Staff lounge library and conference room	225	455	500	635
Total	1,970	2,975	3,577	4,775
ADJUNCT DIAGNOSTIC AND TREATMENT FACILITIES				
PATHOLOGY				
Laboratory	280	455	620	745
BMR, EKG. & Specimen Room	—	190	190	207
Office	—	—	135	170
Morgue	280	495	495	495
Total	560	1,140	1,440	1,617
RADIOLOGY	565	565	1,080	1,285
X-RAY THERAPY	—	—	—	1,775
PHYSICAL THERAPY	520	820	1,020	1,215
OCCUPATIONAL THERAPY	—	—	400	495
PHARMACY *(bulk stores included in central stores area)*				
Solution	—	155	155	170
Pharmacy	205	255	255	280
Manufacturing	—	—	190	280
Total	205	410	600	730
Grand Total	1,850	2,935	4,540	7,117
NURSING DEPARTMENT				
PATIENT AREAS *(Nursing units) a*	2 nursing units	4 nursing units	6 nursing units	8 nursing units
Bed area *(includes room clothes lockers and private room toilets and baths)*	5,955 (50)	11,915 (100)	17,870 (150)	23,830 (200)
Treatment rooms	—	380 (2)	570 (3)	760 (4)
Solaria	965 (2)	1,930 (4)	2,900 (6)	3,865 (8)
Visitors	130 (1)	260 (2)	390 (3)	520 (4)
Nurses stations	365 (2)	730 (4)	1,095 (6)	1,460 (8)

Areas in Sq. Ft.	50-Bed	100-Bed	150-Bed	200-Bed
NURSING DEPARTMENT (Cont.)				
Toilets, baths, bedpans	300 (4 T) (2 B) (4 BP)	600 (8 T) (4 B) (8 BP)	900 (12 T) (6 B) (12 BP)	1,200 (16 T) (8 B) (16 BP)
Utility rooms	380 (2)	760 (4)	1,140 (6)	1,520 (8)
Sub-utility rooms	120 (2)	240 (4)	360 (6)	480 (8)
Floor pantries *(central tray service, used)*	250 (2)	500 (4)	750 (6)	1,000 (8)
Closets *(stretcher, linen, storage, janitor)*	240	480	720	960
Flower rooms	100 (2)	200 (4)	300 (6)	400 (8)
Total	8,805	17,995	26,995	35,995

Each nursing unit to comprise approximately 25 patient beds, distributed about ⅓ private room beds, ⅓ semi-private room beds, and ⅓ ward beds.

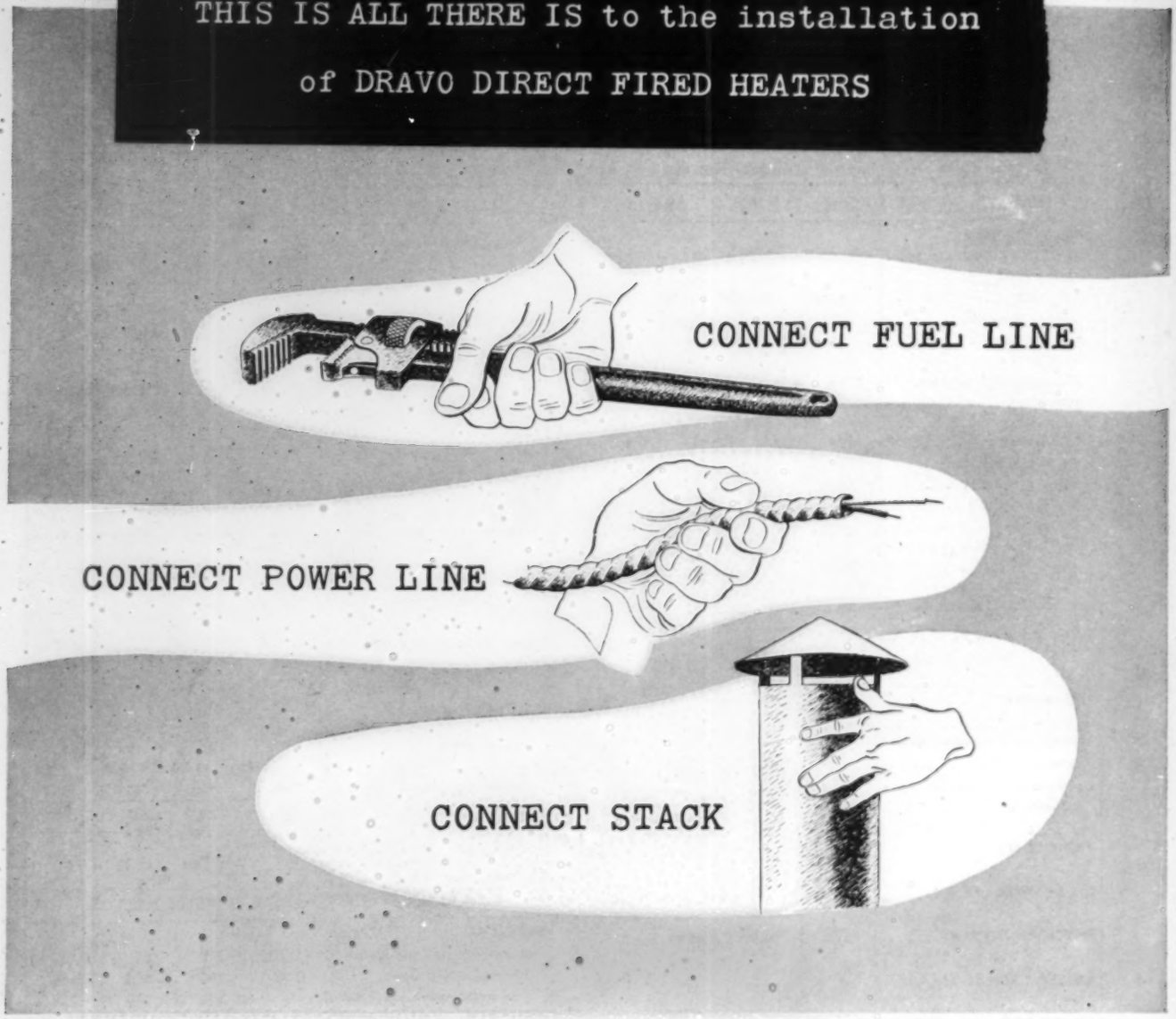
NURSERY				
NURSERY *(Formula Room included in Dietary Area)*				
Nursery *(a)*	255	510	510 (16 B)	765 (24 B)
Premature nursery *(b)*	(8 B)	(12 B)	125 (4 B)	260 (8 B)
Work space & examining space	125 (1)	160 (1)	320 (2)	320 (2)
Suspect nursery *(c)*	80 (2 B)	125 (3 B)	210 (5 B)	250 (6 B
Suspect ante-room	40 (1)	40 (1)	40 (1)	45 (1)
Total	500	835	1,205	1,640

(a) Maximum of 10 bassinets in any one nursery.
(b) Maximum of 4 bassinets in any one premature nursery.
(c) Maximum of 3 bassinets in any one suspect nursery.

SURGICAL DEPARTMENT				
SURGICAL				
Major operating rooms	320 (1)	610 (2)	880 (3)	1,305 (4)
Minor operating room	320	190	225	265
Cystoscopic room	—	190	215	230
Scrub-up alcove *(a)*	60 (1)	105 (2)	185 (2)	185 (2)
Sub-sterilizing room(s)	120 (1)	165 (2)	260 (2)	245 (2)
Central sterilizing and supply	435	520	720	890
Unsterile supply room	90	115	140	160
Instruments	—	—	100	145
Clean up room	120	120	140	140
Storage closet	—	100	140	145
Stretcher space	30	30	45	60
Janitors closet	20	20	20	20
Surgical supervisor	50	60	75	90
Recorder	—	45	45	45
Doctors locker room	185	250	310	340
Nurses locker room	130	180	230	250
Fracture room	—	190	220	220
Plaster closet	—	30	35	35
Splint closet	—	55	55	85
Dark room (x-ray)	—	30	30	30
Anesthesia storage	100	100	140	145
Total	1,980	3,105	4,210	5,030

(a) 3 sinks minimum for each scrub-up alcove.

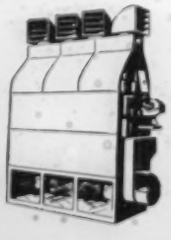
THIS IS ALL THERE IS to the installation of DRAVO DIRECT FIRED HEATERS



By its very compactness, the gas or oil fired Dravo Heater can be installed with a minimum of time and trouble. It is shipped as a self-contained unit with combustion chamber refractory already in place. The minute that a fuel line, electric power and stack outlet are provided, this economical heater will produce warm air at the temperature and time desired—and with a high degree of fuel-to-air efficiency (80 to 85%).

Because of its self-contained features and compactness, the Dravo Heater is unusually flexible in application. It can be easily moved as heat requirements change and, if floor space is scarce, it can be wall-hung or suspended from the roof trusses. In many cases, Dravo Heaters actually provided temporary heat while a building was being constructed and later were moved to permanent heating positions within the new structure.

The Dravo Heater has effected a new economy in open space heating. Let us point out its advantages on your next heating job. Bulletin 514 free on request. Dravo Corporation, 300 Penn Avenue, Pittsburgh 22, Pa.



DRAVO HEATING

AREA CHARTS FOR ACUTE GENERAL HOSPITALS

(Continued from page 129)

Areas in Sq. Ft.	50-Bed	100-Bed	150-Bed	200-Bed
OBSTETRICS DEPARTMENT				
OBSTETRICS				
Delivery room(s)	290 (1)	290 (1)	580 (2)	610 (2)
Labor room(s)	255 (1)	420 (2)	500 (3)	600 (3)
Scrub-up alcove (a)	50	50	60	60
Sub-sterilizing	95	95	115	115
Clean-up room	125	125	125	130
Doctors' lounge	165	265	265	285
Nurses' lockers	75	115	115	150
Nurses' station	45	45	45	55
Non sterile storage	10	10	10	15
Sterile storage	25	40	40	40
Stretcher storage	20	30	30	30
Janitor's closet	20	20	20	20
Total	1,175	1,505	1,905	2,110
EMERGENCY DEPARTMENT				
EMERGENCY				
Emergency operating room	280	280	280	280
Office & waiting room	—	—	80	80
Bath	—	—	50	50
Toilet	20	20	20	20
Utility room	—	—	—	45
Storage & supply closet	45	45	45	45
Stretcher & wheelchair closet	25	25	40	50
Observation beds	—	—	—	205 (2)
Total	370	370	515	775
SERVICE DEPARTMENT				
DIETARY FACILITIES (designed for central tray service)				
Main kitchen and bakery	1,040	1,190	1,350	1,915
Diet kitchen and dietitian's office	150	230	260	350
Formula room	—	255	255	255
Dishwashing and truck washing	180	200	200	255
Refrigeration:				
Meat	30	30	30	35
Dairy products	30	30	30	30
Fruit and vegetable	30	30	45	75
Garbage and can washing	60	60	100	120
Day storage	105	105	150	200
Dining space, *including serving space. Staff supervisory, employees and nurses, (two sittings)*	310	540	810	1,080

(a) Three sinks for each scrub-up alcove.

Areas in Sq. Ft.	50-Bed	100-Bed	150-Bed	200-Bed
SERVICE DEPARTMENT (Cont.)				
Employees (two sittings)	210	400	540	720
Total	2,145	3,070	3,770	5,035
HOUSEKEEPING FACILITIES	1,365	1,480	1,800	1,970
Central linen room, sewing room and housekeeper's office	300	390	400	435
Soiled linen	130	195	225	260
Laundry	935	1,220	1,700	2,020
Total	1,365	1,805	2,325	2715
MECHANICAL FACILITIES (No fuel storage space included)				
Boiler and pump room	900	1,200	1,400	1,500
Engineer's office	—	80	100	120
Maintenance shop(s)	130	200	300	350
Total	1,030	1,480	1,800	1,970
EMPLOYEES FACILITIES				
Nurses locker room (a) (including lockers, toilets, showers and rest room)	330 (24 L.) b (1 T.) (1 Sh.)	540 (48 L.) (2 T.) (2 Sh.)	755 (72 L.) (3 T.) (3 Sh.)	900 (96 L.) (4 T.) (4 Sh.)
Male help's locker room (including lockers, toilets, shower and rest space)	180 (13 L.) (1 T.) (1 Sh.)	270 (25 L.) (1 T. 1 U.) (2 Sh.)	370 (38 L.) (2 T. 1 U.) (3 Sh.)	410 (50 L.) (3 T. 1 U.) (4 Sh.)
Female help's locker room (including lockers, toilets, shower and rest room)	255 (13 L.) (1 T.) (1 Sh.)	405 (25 L.) (2 T.) (2 Sh.)	570 (38 L.) (3 T.) (3 Sh.)	585 (50 L.) (4 T.) (4 Sh.)
Total	765	1,215	1,595	1 895
STORAGE				
Record	175	240	330	390
Central stores (c)	1,000	2,000	3,000	4,000
Total	1,175	2,240	3,330	4,390

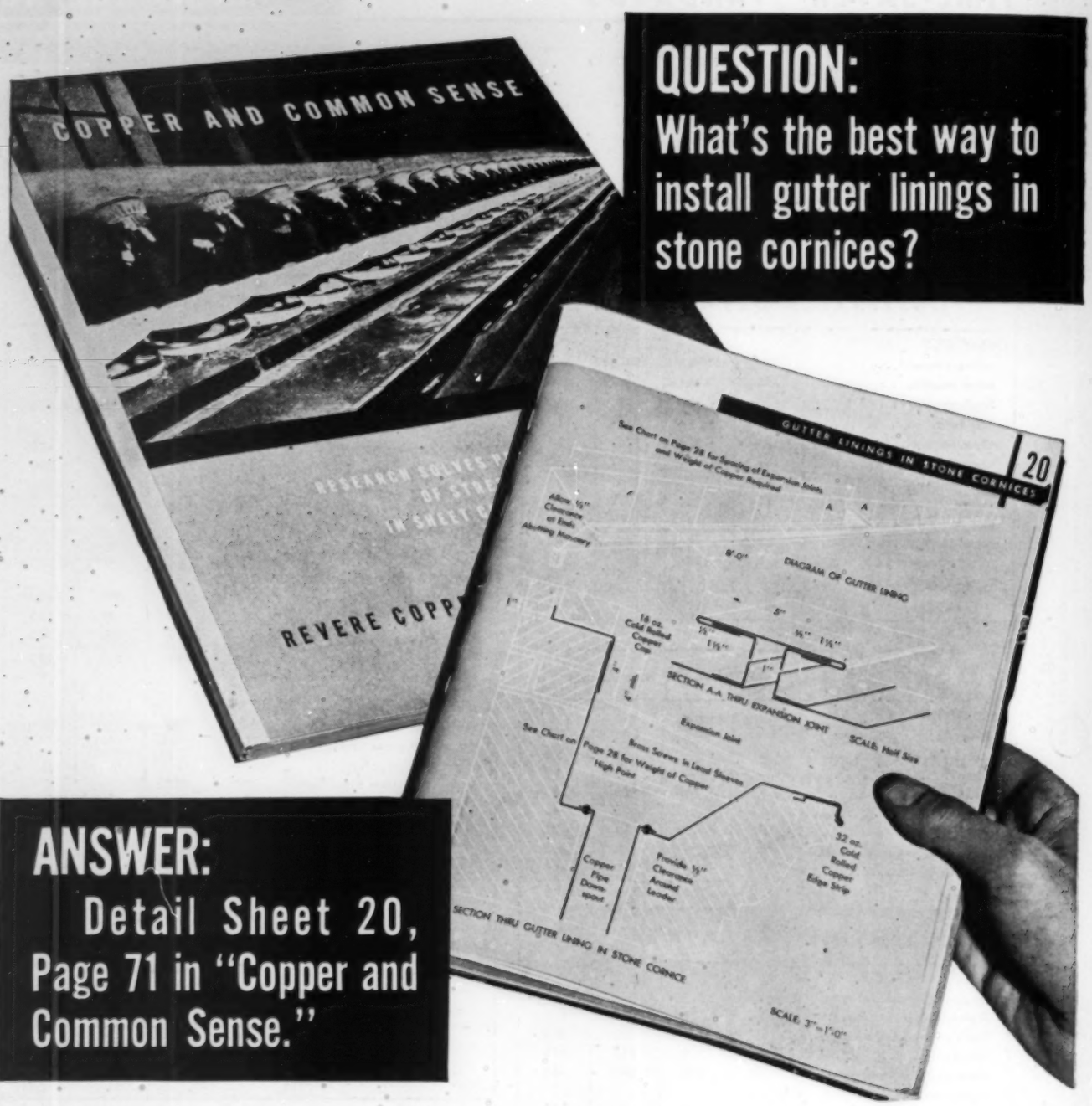
(a) Includes provision for special nurses.
(b) L: lockers; T: toilets; Sh: showers; U: urinals.
(c) Minimum. Based on 20 square feet per bed. Many authorities recommend storage areas up to 40 square feet per bed.

Areas in Sq. Ft.	50-Bed	100-Bed	150-Bed	200-Bed
CIRCULATION SPACES				
CIRCULATION SPACES				
Corridors	6,910	11,535	16,850	22,170
Stairways	810 (2)	1,345 (2)	2,145 (3)	2,945 (4)
Elevators	290 (1)	825 (2)	1,290 (3)	1,760 (4)
Total	8,010	13,705	20,285	26,875

or decreased as the expected activities and functions of the proposed hospital may indicate.

All areas shown in the tables are *Net* areas and do not include walls and partitions. For customary fireproof construction, gross areas may be computed by using approximately 114 per cent of the areas shown. Cubage may be estimated by multiplying this figure by the height between floors.

Bed capacities shown are based on the total of adults' and children's beds only. Space for the number of bassinets expected to be required is provided for (see nursery), but these bassinets are not included in the bed count.


COPPER AND COMMON SENSE
REVERE COPP
GUTTER LININGS IN STONE CORNICES
20
DIAGRAM OF GUTTER LINING
SECTION A-A THRU EXPANSION JOINT
SCALE: Half Size
Expansion Joint
Brass Screws in Lead Sleeves
16 oz. Cold Rolled Copper Cap
32 oz. Cold Rolled Copper Edge Strip
Copper Pipe Downspout
Provide ½" Clearance Around Leader
SECTION THRU GUTTER LINING IN STONE CORNICE
SCALE: 3"=1'-0"

QUESTION:
What's the best way to install gutter linings in stone cornices?

ANSWER:
Detail Sheet 20, Page 71 in "Copper and Common Sense."

Important new facts on sheet copper construction are now available as a result of Revere's research on stress failures. Checked and acclaimed by leading architects and sheet metal experts, Revere's 96-page booklet, "Copper and Common Sense," is a practical guide to durable construction of gutters, flashings, and roofs. That's why it will always pay to refer to this authoritative book.

Complete with charts and detailed information on seam roofing, gutters, gutter linings, flashing, expansion joints, etc., this booklet contains the answers which reduce this type of construction to a matter of engineering design.

Compiled as a result of Revere's research program, "Copper and Common Sense" is written to meet the daily needs of practical men. You can read and apply directly final figures from large charts to insure the finest sheet copper construction.

If you wish any further aid, call on the Revere Technical Advisory Service, Architectural.

Complimentary copies of this booklet have been sent to all holders of Sweet's Architectural File, and through Revere Distributors to most sheet metal contractors. If you do not have a copy, write for it now while there are still a few available. Revere building products are sold only through Revere Distributors.

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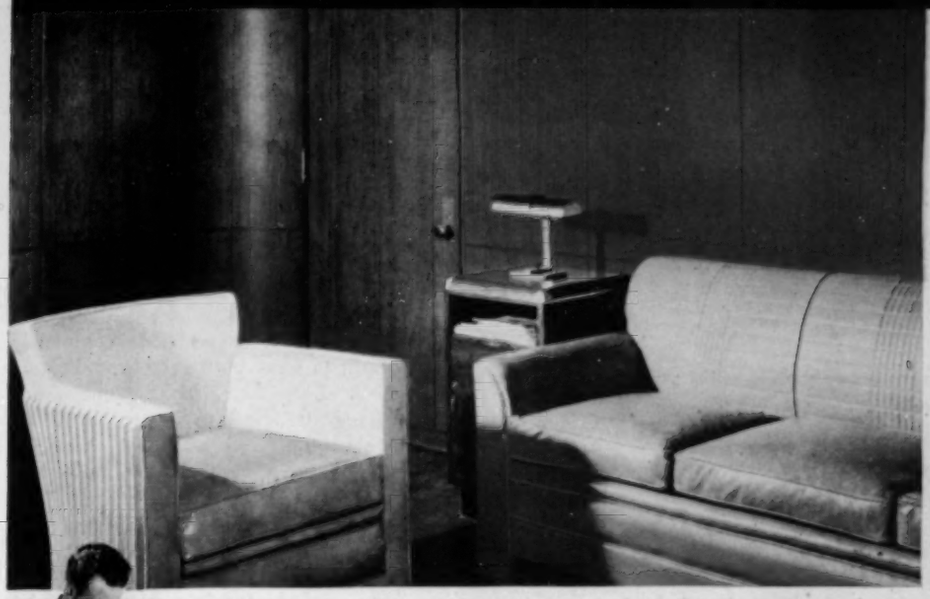
BUILDING? MODERNIZING? PARTITIONING?



See this 10 minute demonstration

Here's a Newer, Better Way to Divide Space

By use of a few standardized parts and fittings, M/P Metlwals meet every wall paneling and partitioning requirement . . . eliminate the need for plaster in new construction . . . and permit fast, clean, simple installation in dividing space. They combine rich beauty, quiet and fire resistance with low initial cost and permanent economy.

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Made in lifelike wood grains and soft color finishes . . . providing an all-flush surface from floor to ceiling . . . eliminating the need for filler boards of other materials at ends or above the cornice level . . . M/P Metlwals of Bonderized steel make possible an endless variety of new, modern decorative effects. And you can use these distinctive interiors for executive, factory and general offices, stores, banks, theatres, hotels, hospitals, schools, residences and other buildings of every kind.

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The nearest M/P Distributor listed at the right is ready to give you a 10 minute demonstration of the unique features of M/P Metlwals. Write or phone him today. Also, for your A. I. A. file, send for booklet No. 35-H-6, containing Metlwal specifications, drawings and installation photographs. Address: Martin-Parry Corporation, Fisher Bldg., Detroit 2, Michigan. Plants: Toledo, Ohio; York, Pennsylvania.

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New York City — Jacobson & Co., Inc.
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OHIO
Cincinnati — E. C. Decker & Co.
Cleveland — The Mid-West Acoustical & Supply Co.
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Philadelphia — The W. M. Moyer Co.
Pittsburgh — Harry C. Leezer Co.
TENNESSEE
Knoxville, Nashville, Memphis — Acoustics & Specialties
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PRODUCTS

METLWALS ALL-FLUSH PANELING MOVABLE PARTITIONS

66 Years of Service

ENGINEERING AND ERECTING SERVICE AND WAREHOUSE STOCKS FROM COAST-TO-COAST

Queens, has been awarded to the George A. Fuller Company. Plans are being prepared by Voorhees, Walker, Foley & Smith, architects.

Plans include two 13-story buildings containing 600 apartments, and a spread of two- and three-story buildings which will aggregate 2,600 additional units. A community center, shopping facilities, a theater, a nursery school, playgrounds and central garages for 1,700 cars are to be provided. Only about 20 per cent of the 155-acre tract, the former site of the Fresh Meadow Country Club, will be occupied by buildings. The balance will consist of roads, parks and recreation areas.

Prize Houses

Ground breaking ceremonies June 2 at 100 W. Washington Blvd., Lombard, Ill., launched the *Chicago Tribune*'s Prize Homes Building program under which selected designs from the 24 prize-winners in the newspaper's recent Chicagoland Prize Homes competition will be constructed on sites throughout Chicago and suburbs.

For 30 days after building is completed, each of the homes will be open for public inspection before it is occupied by its owner. Arrangements have been completed for the construction of 10 houses so far, all of them for veterans.

NELA PARK REOPENS

Formal reopening of the General Electric Lighting Institute at Nela Park, Cleveland, has been set for the week of August 5.

The Institute has been completely rebuilt to serve both present and future needs of the G.E. Lamp Department. Among the displays incorporated are: a color quality room to show the effects of light on merchandise; a patio "sun deck" capable of furnishing from 3,000 to 5,000 footcandles with infrared and ultraviolet radiation equivalent to that of midsummer sunshine; an office lighting room featuring fluorescent principles, accessories and equipment; an ideal schoolroom flooded with synthetic daylight and equipped with automatic electronic controls to compensate for the caprice of natural daylight; "Q & Q" rooms for fitting quantity of light to quality of light; home lighting demonstration rooms; a shopping center; and a lighting design room featuring new materials.

COMPETITIONS

Store Contest

The New York Chapter of the American Designers' Institute has announced the Garrison's Magazine contest for the best design for a small store. The contest is open only to members of the Institute.

Rules are drawn up for a junior department store of moderate size, carrying "family store" lines. Open display, interchangeable units and flexibility are stressed. Prizes total $1,500, and after the close of the contest the drawings will be sent on a nation-wide exhibition tour. Closing date is December 15, 1946. For further information address The American Designers' Institute, c/o Garrison's Magazine, Inc., 110 E. 42nd St., New York 17, N. Y.

Steel Structures

A new $200,000 Design-for-Progress award program has been announced by The James F. Lincoln Arc Welding Foundation. It provides 452 awards for papers embracing every field of industry and research where arc welding may be applied with attendant benefits. Fifteen classifications and 43 divisions have been established for participation.

Two of the classifications, "Structural

(*Continued on page 136*)

Look to usAIRco for a *complete* line of Air Conditioning equipment. Engineering and production skill are combined at usAIRco to build complete systems, packaged units, and the tools of air conditioning—with the extra values that make your customers more satisfied and make your sales more profitable. Find out about the *complete* usAIRco line.

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HERE'S HOW G.E. CAN HELP YOU PLAN AN X-RAY DEPARTMENT

Planning the X-Ray Department—one of the most important departments in any hospital regardless of size—is a project which demands careful coordination of the knowledge, judgement, and experience of every individual immediately concerned . . . the architect, the hospital superintendent, the radiologist, members of the building committee, and the x-ray manufacturer.

For many years G.E. X-Ray has been privileged to cooperate with the nation's top-flight hospital architects in the planning of x-ray installations ranging from compact, low-power units to modern 1,000,000-volt therapy apparatus . . . cooperation which has insured the greatest convenience and operating efficiency in the X-Ray Departments of the world's finest hospitals.

Hospital architects and administrators find our layout engineers a reliable source of information and practical suggestions, based on knowledge accumulated over the years in working out detailed plans for hundreds of specialized X-Ray and Physical Therapy Departments.

And their suggestions include details, seemingly minor to the uninitiated, yet exceedingly important in the long run. For facts concerning this service, address General Electric X-Ray Corporation, 175 W. Jackson Blvd., Chicago 4, Ill., Department 2582.

GENERAL ELECTRIC X-RAY CORPORATION

— Buildings or Bridges," and "Structural — Houses and Miscellaneous," are divided into two divisions each. The two divisions of the first group are (1) Commercial Buildings and Similar Structures, and (2) Bridges. The two of the second group are (1) Domestic Shelters, Houses, Barns, etc., and (2) Miscellaneous Structures, Abutments, Caissons, Dams, Tunnels, etc. Twelve awards, totaling $9,000, are offered for each of these classifications.

For complete details, address the Secretary, The James F. Lincoln Arc Welding Foundation, Cleveland 1, Ohio. The contest closes June 1, 1947.

EXPOSITIONS

Electrical Engineering

The Electrical Engineering Exposition, originally planned for Philadelphia for 1941 and postponed because of the war, will be held in the 71st Regiment Armory, New York City, January 27–31, 1947. It will run concurrently with the winter convention of the American Institute of Electrical Engineers.

Construction Industries

The first annual Construction Industries Exposition and Home Show, held in Los Angeles July 12–21, drew over 200 separate exhibitors. The exhibits were catalogued in 44 distinct categories, all allied to the building industry, and included innovations in home construction, remodeling, home furnishings and appliances. Two model homes were built on the exposition grounds, adjacent to the main auditorium, one of which was given away to a veteran during the show, the other of which was sold to a veteran at construction cost.

Home Builders

Plans for the 1947 Convention and Exposition of the National Association of Home Builders already are being made. The Stevens Hotel, Chicago, has again been selected as headquarters, with the dates set for February 24–27. Since 65 per cent of the 1946 exhibitors so far have indicated their intention to participate in 1947, and many of them have requested more space, an entire new floor plan has been laid out to provide larger individual exhibit areas.

ET TU, BRITAIN?

From E. Howard, London architect, comes a letter reporting on Britain's progress in building. It reads in part:

"I am sorry to say that the housing program in Britain is not shaping at all. It is in a miserable and chaotic state. Few houses are being built, and the Socialist government wants to do all these through local authorities and will not give private enterprise a chance. Before the war private enterprise built over three quarters of the houses for the working classes in this country. Now they are gradually being pushed out. During the last two years manpower has been very restricted and everything was put down to lack of men. Along with many other people, I pointed out to the government about two years ago that there would be a tremendous shortage of building materials, especially of bricks, after the war, and it was suggested that preference should be given to men who had worked on materials for the building industry to have priority of release from the Services, but the War Office and other government departments would not do this. Consequently we have a tremendous bottleneck of manpower, and no materials. Now an embargo has been put on all materials that are produced in this country, and none can be purchased without a license. This practically puts private enterprise out of the reckoning."

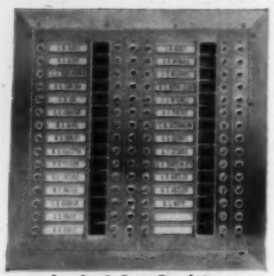
(*Continued on page 138*)

Hospital Signal Equipment Hints for Architects

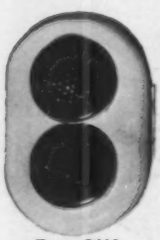
29 YEARS EXPERIENCE BUILDING HOSPITAL EQUIPMENT

Type HMP1

FOR more than a quarter of a century Cannon Electric has been furnishing America's hospitals with various types of high quality signal and special lighting equipment. A few of the items are listed here . . . At the LEFT is the 1-gang Private Room *Bedside Calling Station*. This is the smallest of the 8 basic styles which include 2 and 3 gang types. At the RIGHT is one of the *Doctor's In-and-Out Registers*, indispensable to a modern hospital. Made in many sizes and variations.



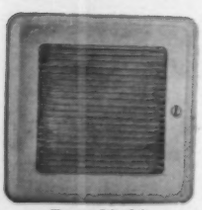
In-And-Out Register



Type DN2

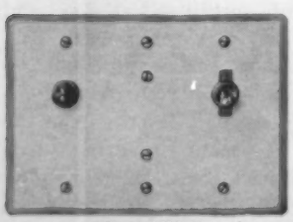
At the LEFT is *Corridor Door Light*, one of several types which also includes *Intersection Lights*. At the RIGHT is pictured the newest development for hospital operating rooms, an *Electrostatic Grounding Intercoupler* which eliminates the danger of electro-static explosions where hydro-carbon gases are used as anesthetics.

Type HG-A456



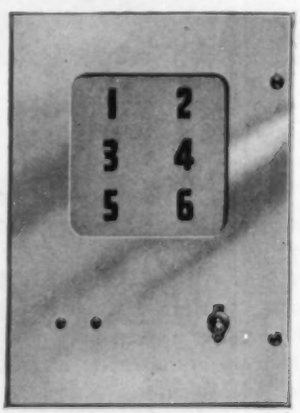
Type PL-10

Aisle Lights, shown at the LEFT are ideal for corridors, stairways and rooms where only a modicum of light is needed. At the RIGHT is a *Nurses' Station Annunciator* furnished in standard sizes from 6 to 100 lamps, equipped with soft tone buzzer, thermostatically controlled.



Type SUP-1

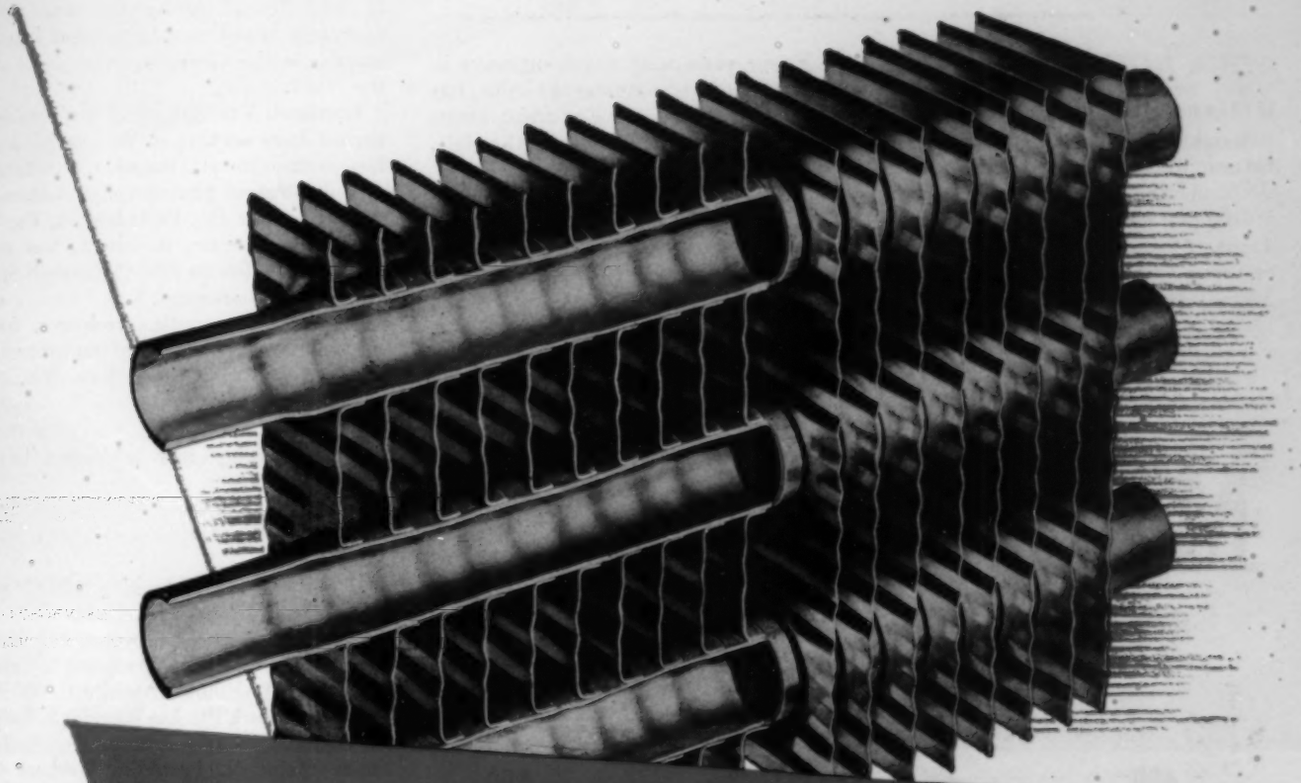
At the LEFT is a *Nurses' Supervisory Station*, for use in utility rooms, etc., where it is advisable to provide call service. Available in 1 to 4 pilot lights and soft tone buzzer. Write for Cannon Electric Signal Systems Bulletin.



Station Annunciator

CANNON ELECTRIC

CANNON ELECTRIC DEVELOPMENT COMPANY, LOS ANGELES 31, CALIFORNIA



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Performance in operation is the true measure of value. And it is the performance record of McQuay Ripple Fin Coils that has proved their advantages and established preference everywhere for their exclusive construction.

Increased heat transfer surface is just one of the superior features of ripple fins. In addition, this construction provides higher flexible strength with *less* air friction and cleaner operation.

The wide-collared fins permit greater contact surface with the tubes and a permanent mechanical bond is formed by hydraulic expansion of the tubes after they are in place. To meet unequal expansion and contraction, headers are of non-ferrous tubes for greater flexibility.

McQuay coils are available in a wide variety of styles and sizes, both standard and special coils for steam, hot water, cold water, brine, direct expansion and other applications.

For complete information write McQuay, Inc., 1605 Broadway Street N. E., Minneapolis 13, Minn.

McQuay INC.

. . . AIR CONDITIONING EQUIPMENT ESPECIALLY DESIGNED FOR INDUSTRY

OFFICE NOTES

Offices Opened, Reopened

Ralph Bryan, Architect, has resumed his practice after four years of service in the Civil Engineering Corps of the Navy. He is a past president of both the North Texas Chapter, A.I.A., and the Dallas Section, Texas Society of Architects. Address (temporary): Construction Bldg., Dallas, Texas.

William Dewsnap, Architect, following four years with naval engineers in the design of war emergency ships, has returned to the practice of architecture, with offices at 42 Powell Rd., Allendale, N. J.

Matthew B. Ehrlich, has announced the opening of his office for the practice of architecture in the Crozier Bldg., 1420 Chestnut St., Philadelphia 2, Pa.

E. Carleton Granbery, Jr., and Diana Allyn Granbery have announced the opening of their office for the practice of architecture at 34 Livingston St., New Haven, Conn. During the war Mr. Granbery served as a Lieutenant Commander in the Civil Engineer Corps of the Navy.

Cortlandt Van Dyke Hubbard has returned from serving in the Navy, and has resumed the practice of architectural and illustrative photography. Address, 2201 Chestnut St., Philadelphia, Pa.

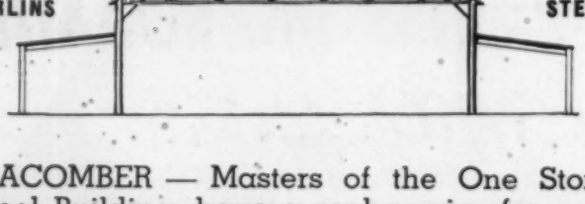
Jos. P. Schierer, Architect, has reopened his office at 404½ Marshall St., Room 201, Shreveport, La.

John E. Somerville, Architect, has announced the opening of an office at 230 E. Walnut St., Green Bay, Wis.

MACOMBER

STANDARDIZED SERVICE IN STEEL CONSTRUCTION

ROOF TRUSSES AND ROOF PURLINS — STEEL JOISTS — LONGSPANS — STEEL DECKING AND STEEL SIDING



MACOMBER — Masters of the One Story Steel Building, have a real service for you. It includes:

1—Fabrication and erection of the complete building.

2—Fabrication of the roof supporting members only where masonry walls are used.

3—A wealth of engineering information as a result of specialization in this type of construction.

Here is standardization in steel building products that does not limit either you nor the occupant in the kind of building that serves his needs best. Your contractor knows Macomber products. He will expend far less equipment in their erection. If you are interested in some helpful suggestions and further information drop us a line.

MACOMBER

CANTON • OHIO

MEMBER OF THE STEEL JOIST INSTITUTE

New Addresses

The following new addresses have been announced:

Burks and Anderson, Architects, 502 Wallace Bldg., Markham and Main Sts., Little Rock, Ark.

J. Lloyd Conrich, Architect, 593 Market St., San Francisco 5, Calif.

W. P. Day and Associates, 111 New Montgomery St., San Francisco 5, Calif.

Daniel A. Elliott, Architect, 666 S. Lafayette Park Pl., Los Angeles 5, Calif.

Franklin, Douden & Associates, Architects (John N. Franklin, Herbert C. Douden, Arthur R. Ruprecht), 552 Century Bldg., 130 Seventh St., Pittsburgh 22, Pa.

Morris Lapidus, Architect, 256 E. 49th St., New York 17, N. Y.

McEnary & Krafft, Architects, 1110 McKnight Bldg., Minneapolis 1, Minn.

Thomas Henry Moran, Architect, Hillcrest Estates, Jefferson Rd. and Route 31, Princeton, N. J.

Edward A. Schilling, Architect, 728 Michigan Bldg., 220 Bagley Ave., Detroit 26, Mich.

Harvey A. Schwab, A.I.A., 552 Century Bldg., 132 Seventh St., Pittsburgh, Pa.

Firm Changes

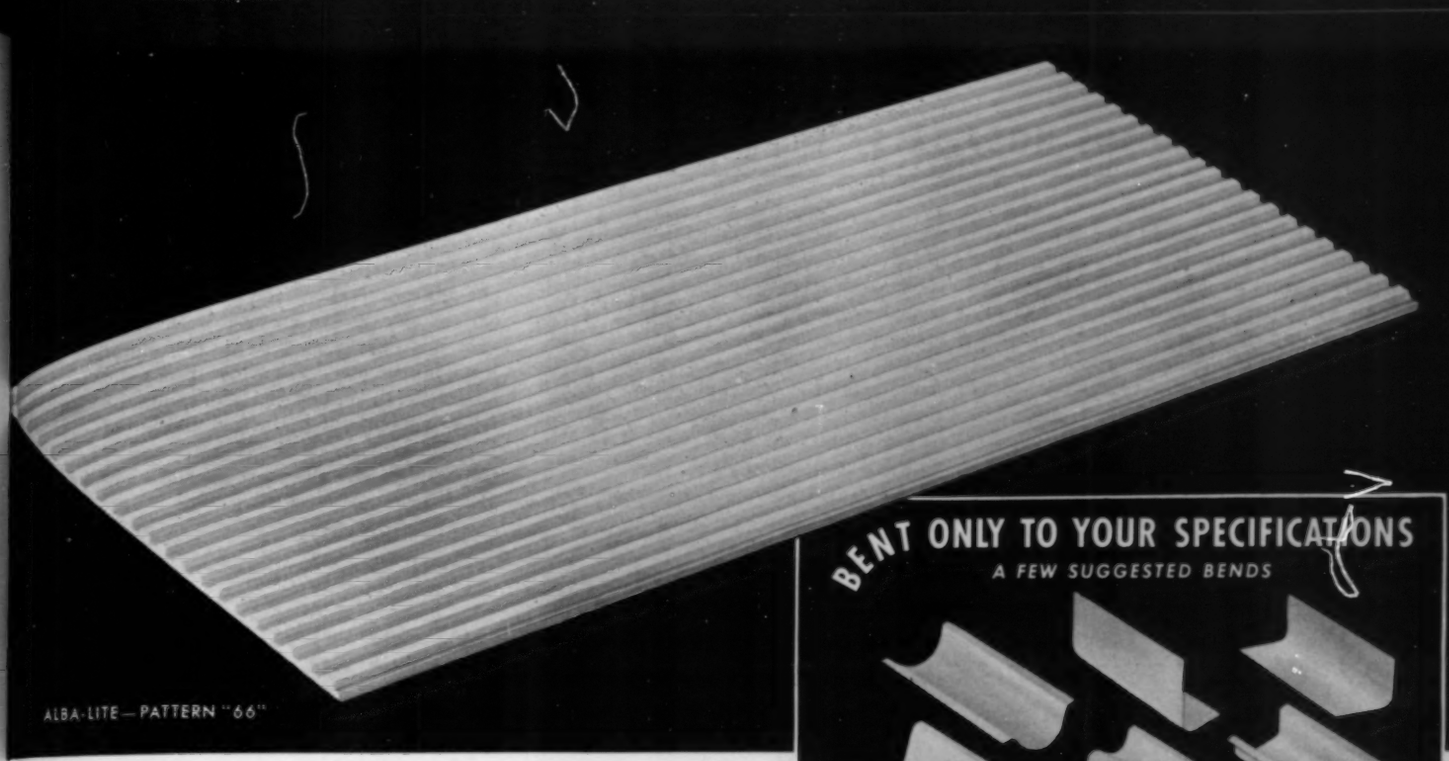
Arthur Bassin, Architect and City Planner, David B. Cheskin, Engineer, and Barney G. Tokarsky, Engineer, have announced their association under the firm name of Bassin, Cheskin and Tokarsky, Architects, Engineers, Planners, with offices at 407 S. Dearborn St., Chicago 5, Ill.

Joseph Ceruti, A.I.A., has been retained by Designers for Industry, Inc., Cleveland, Ohio, as a practicing architect.

Edward J. Content, broadcast engineer and acoustical expert, has left WOR, New York, to establish his own business as an acoustical consultant and studio design specialist. Address, Roxbury Rd., Stamford, Conn.

Austin C. Damon & Associates, and Leon M. Worley, Major, C.E., have announced the formation of a partnership for the practice of architecture

(*Continued on page 150*)



ALBA-LITE...

CORNING'S COMPLETELY NEW LIGHTING GLASSWARE GAINS ENTHUSIASTIC APPROVAL!

The recent introduction of Corning's new ALBA-LITE lightingware has resulted in immediate acceptance.

It has proved to be the ideal answer for fixture manufacturers to the needs of modern fluorescent lighting.

ALBA-LITE FEATURES

ALBA-LITE is the new rolled sheet form of alba glass developed by Corning. Light diffusion is attained through the special composition of the glass rather than through surface treatment. The result is a smooth, easy-to-clean surface and permanent, uniform color.

ALBA-LITE is now available from stock in four commercial patterns.

ALBA-LITE opens up numerous design possibilities and adds beauty and luster to any lighting assembly...supplied flat or bent to your specifications with or without flanges... light in weight—in $\frac{1}{8}$" or $\frac{7}{32}$" nominal thickness.

ALBA-LITE is a translucent glass with high light transmission and low light absorption.

Send for free sample of

ALBA-LITE

Send your request on your company letterhead.

Lighting Sales Dept., AR-8

CORNING GLASS WORKS
CORNING, N. Y.

"CORNING" is a registered trade-mark and indicates manufacture by Corning Glass Works, Corning, N. Y

CORNING *means* Research in Glass

Corning Engineered Lightingware
BRAND

WHO DESIGNS THE HOSPITALS?

An interesting sidelight on a currently controversial issue is a letter recently received from an ARCHITECTURAL RECORD advertiser, a manufacturer of hospital equipment. The writer of the letter had been told — on what should have been good authority — that some 400 specialized hospital architects are responsible for all the hospitals designed in this country.

Such a statement implies acceptance of the philosophies highlighted by the American Hospital Association's listing of "qualified hospital architects" — i.e., those architects who had already designed successful hospitals. This listing prompted a controversy between the A.H.A. and the American Institute of Architects which culminated in a resolution passed at the A.I.A. convention last May instructing its Board of Directors "to disapprove the nominations of A.I.A. members for the examining board of A.H.A. together with any suggestions of approval thereof, understood or implied," and advising the A.H.A. that the A.I.A. "looks upon any specialized list as undemocratic in principle and contrary to ethical practice."

Furthermore, the statement made to our advertiser about the number of architects engaged in hospital work is not very plausible in view of the many projects under way each year. From the records of F. W. Dodge Corp. comes the following table of the actual number of hospital projects in the 37 states east of the Rockies over the past nine and a half years:

12 months, 1937	901
12 months, 1938	1,182
12 months, 1939	978
12 months, 1940	1,674
12 months, 1941	2,845
12 months, 1942	5,384
12 months, 1943	3,087
12 months, 1944	1,127
12 months, 1945	2,515
5 months, 1946	418

Obviously, with contracts for hospital projects running into annual totals such as these, no small number of "qualified hospital architects" can be responsible for them all.

Furthermore, a check of any list of architects busy with hospital work in one year against Dodge activity records for the following year shows that only a relatively few are again busy on the same type of work. Hospital specialists, the figures indicate, account at best for only some 25 per cent of the hospital projects contracted for each year.

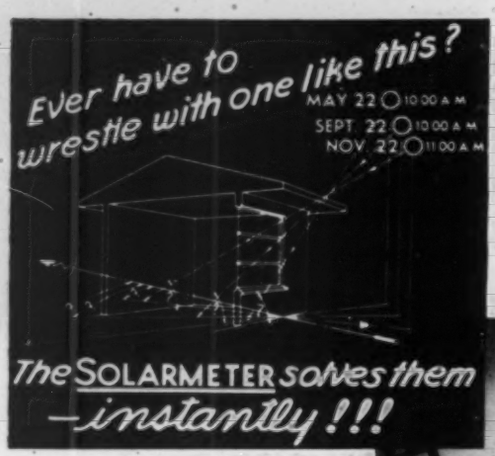
It is the practical and ethical side of the question, however, which is most likely to draw objections from architects.

In the first place, how can architects get experience in hospital design if only those who have already had such experience are given hospital work?

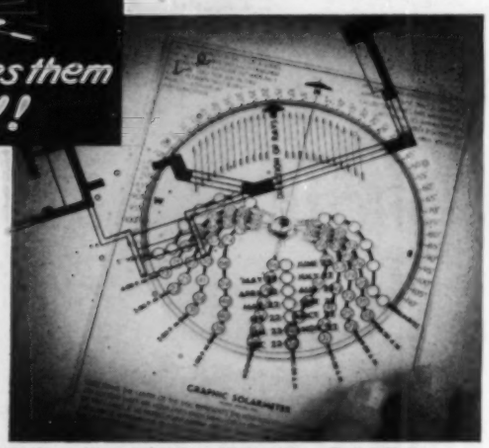
Secondly, would not inclusion in a list of hospital specialists tend to limit an architect to work in that one field, and preclude his consideration for work in another field?

Third, specialization quite easily could lead to stereotyped work — a staling of a once fresh point of view. Thus the best solution to a particular hospital problem may quite feasibly come from a non-specialist who will bring to it that needed freshness.

Presumably the intention of the A.H.A. in listing "qualified hospital architects" is to protect the best interests of the public by preventing the selection of unqualified men for the work of hospital design. But it has been proved time and again that architectural talents shown in one field are readily transferable to another field. A hospital building committee simply should seek the best architect available for the job, whether or not he has previously done hospital work. It is ability that counts.



hospital ?
residence ?
school ?
housing ?
commercial ?
...ANYTHING!



you don't need tables...
you don't need diagrams...
you don't need math...
you don't need to be an astronomer...

A SOLARMETER PUTS THE SUN AT YOUR FINGER TIPS!

PLACE a Solarmeter on any part of any plan; set the dial for the day and hour. The arrow points — and there's your answer. The Solarmeter gives direction and inclination of the sun's rays in one setting, and makes determination of sunshine penetration a matter of simple graphics.

There is a Solarmeter calibrated for your own particular band of latitude. Write for your Solarmeter today. Honest — the supply is really limited!

PLEASE SEND ME a Graphic Solarmeter calibrated for my band of latitude.
Check for $3.00 enclosed — refund if requested.
Send for week's trial without obligation.
Send for FREE descriptive booklet.

K. W. JUSTICE, BELVEDERE (*Marin County*), CALIFORNIA

Music is a friend of health . . .

RCA Control Console gives finger tip control to all speakers and earphones in any part of the hospital.

Headphones and program selector stations at every bedside for individual use af each patient.

Loud-speakers on sun porches bring music and entertainment to convalescents.

. . . RCA Sound System

in Crile General Hospital speeds veteran rehabilitation . . . simplifies administration

At the Crile General Hospital, Cleveland, recently taken over by the Veterans Administration, music will play an important role in the entertainment and rehabilitation of convalescent servicemen.

The RCA Hospital Sound System at Crile provides individual earphones for every soldier's bedside . . . gives him a choice of network programs or recorded music from the hospital's own studio. Wall speakers bring entertainment to sun porches, dining halls, and recreation rooms.

Hospital administration is streamlined to maximum efficiency. Doctors, nurses, the entire staff can be simultaneously paged in any part of the hospital plant . . . can always be in instant touch with each other.

Include RCA Hospital Sound Systems in your new construction and remodeling plans. They are "tailor-made" to suit each hospital's needs.

Write for illustrated booklet. Dept. *10-H*, Sound Equipment Section, Radio Corporation of America, Camden, N. J.

SOUND SYSTEMS

RADIO CORPORATION of AMERICA

ENGINEERING PRODUCTS DEPARTMENT, CAMDEN, N.J.

In Canada: RCA VICTOR Company Limited, Montreal

(*Continued from page 124*)

KITCHEN FANS

Two new electric kitchen ventilating fans have been announced by one company. One is a 16-in. fan designed for exhaust duty for small restaurant kitchens, shops, lavatories, etc.; it operates on 66 watts, exhausts 1650 cu. ft. of free air per minute. Featuring slow speed operation, overlapping blades for quiet operation, and fully enclosed, dust-proof motor, the fan has an outlet box attached for connection of conduit and can be easily mounted on a suitable panel board.

The other new fan is a 12-in. unit designed for quiet, slow-speed operation. Operating on 53 watts, it exhausts 900 cu. ft. of air per minute, has overlapping blades and fully enclosed motor. Two sizes of adjustable mounting panels for windows or transoms, 27 to 48 in. in width, are available for use with this unit. The Emerson Electric Mfg. Co., St. Louis, Mo.

The Barcol OVERdoor on Residence Garages

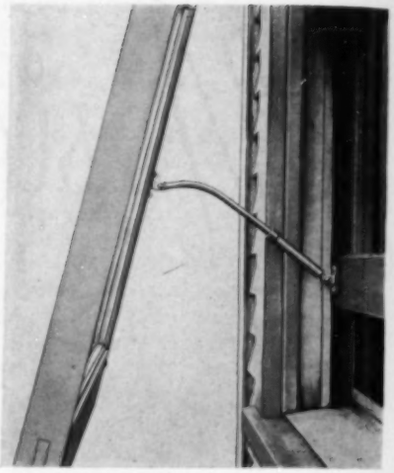
Barcol OVERdoors have a number of distinctive features which are important where you want a garage door that will close tightly yet work easily. **Tailored twin-torsion** counterbalancing springs are used, mounted on the wall directly above the opening. They are neat in appearance, quiet, safe, and can be individually and accurately adjusted. **Self-latching bolts,** which engage automatically when the door is pulled down, add much to the efficiency, speed, and ease with which the Barcol OVERdoor can be opened and closed. **Roller-crank closing action** provides tight and weatherproof closing. At the same time, this Barcol feature prevents the door from jamming when closed, or sticking and binding when in motion. **Continuous vertical track brackets** not only increase the structural strength and durability of the supporting framework, but also give added protection as they cover the cables that carry the door weight. **Only the Barcol OVERdoor has ALL of these features.** For lasting satisfaction, specify and install the Barcol OVERdoor on all types and sizes of residence garages.

BARCOL

FACTORY-TRAINED SALES and SERVICE REPRESENTATIVES IN PRINCIPAL CITIES

BARBER-COLMAN COMPANY

102 MILL ST. • ROCKFORD, ILL.



Automatic storm window regulator unit

WINDOWS

Storm Window Regulator

An easily installed automatic storm window regulator that opens and closes the window as the inside sash is raised and lowered is now in production.

Two of these *Award Regulator* units are required for each storm window, one for each side, replacing the customary side supports for top-hung storm windows. The higher the inside window is raised, the wider the storm window opens. If desired, the mounting can be inverted so that the storm window will automatically open whenever the upper window is lowered. Any position of the windows can be held, from a few inches to completely open.

The units are made from magnesium alloy, with all other metal parts electroplated for proof against rust and deterioration. Award Mfg. Co., 3727 N. Palmer St., Milwaukee 12, Wis.

Basement Window

A precision-made basement window, the *H & R Aristocrat*, features easy opening, easy removal from frames for reglazing or washing, suitability for any type of home construction, double seal against moisture and vermin, maximum daylight and positive locking handle. Windows are made of heavy gauge hot-rolled steel, pickled in oil and electrically welded. Sizes conform to postwar specifications of the Metal Window Institute. H & R Machine Tool Co., Cleveland, Ohio.

"Floating" Sash

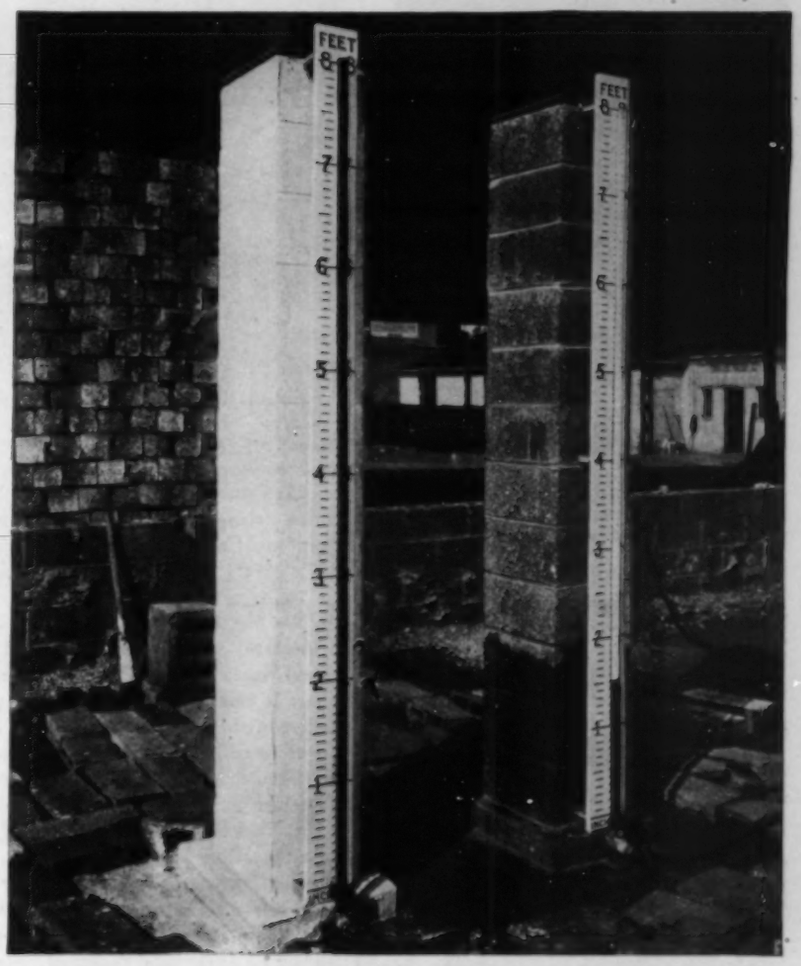
To eliminate the common window difficulties of sticking and binding, cleaning of the outside surfaces, drafty ventilation and complicated working parts and counterbalances, the new *Ventair* window "floats" the sash.

The Ventair can be tipped to a ventilating position or each sash can be quickly removed for full ventilation or cleaning. Eash sash tilts inward a few inches to circulate fresh air upward toward the

(*Continued on page 144*)

500-lb. HYDROSTATIC PRESSURE TEST ON CINDER BLOCK COLUMNS PROVES WHY

AQUELLA makes WET CELLARS and WALLS Bone Dry!



The Aquellized column, at left, holds an 8-ft. head of water (500 lbs. per sq. ft. at the base); the untreated column offers no practical restriction to the flow of the water through its walls.

The two columns you see here were set up to determine the effect of a hydrostatic pressure created by an 8-ft. head of water on a surface treated with Aquella.

Both columns were made of highly porous cinder blocks, with an absorption rate of 15% by weight.

First, both columns were tested in their natural state and showed that they had identical coefficients for permeability. After such tests, the column on the *left* was treated with Aquella, while the one on the *right* was not.

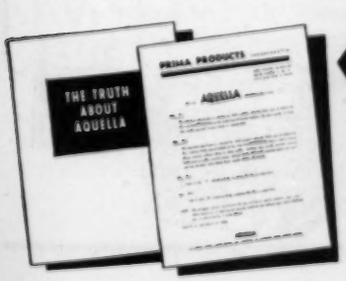
The Aquellized column withstood the pressure of an 8-ft. head of water, equivalent to a hydrostatic pressure of approximately 500 lbs. per sq. ft., at the base.

The untreated column could not be filled with water higher than 18¾", because the water seeped through its cinder blocks at the rate of 2 gallons per minute.

Tests prescribed by the U. S. Bureau of Standards call for a maximum 2-inch head of water, or 10 lbs. pressure per sq. ft. The test described here is therefore approximately 50 times more severe than that prescribed by the U. S. Bureau of Standards.

Aquella having proved its effectiveness under conditions as extreme as this, must necessarily be equally successful when applied to other types of masonry construction such as concrete, brick, stucco or cement plaster.

AQUELLA IS A "MUST" ON EVERY CINDER BLOCK JOB!

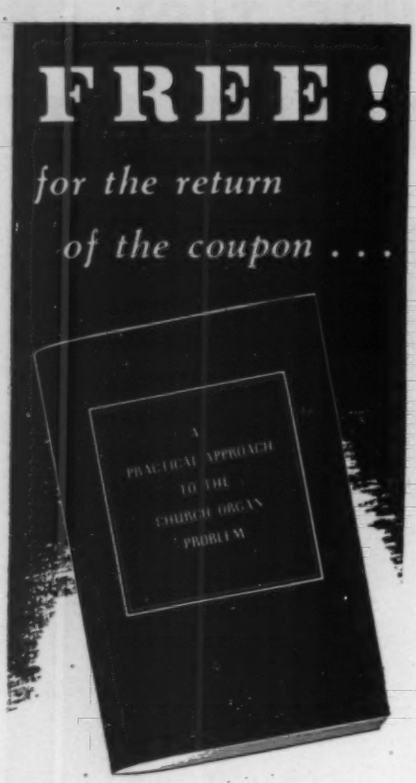


YOU'LL WANT THIS INFORMATION FOR YOUR WATERPROOFING FILE

Write today for your copies of "THE TRUTH ABOUT AQUELLA," *and the* "KEY TO AQUELLA SPECIFICATION TYPES."

PRIMA PRODUCTS, INC.

DEPT. (E) 10 EAST 40TH STREET, NEW YORK 16, N. Y.



A BOOK THAT ANSWERS THE PROBLEMS OF THE CHURCH ORGAN COMMITTEE

This is not a "piece of advertising". It is the most comprehensive collection of information ever compiled between two covers on the subject of planning for, selecting and installing a new church organ. It is written in non-technical language, but from the architectural and engineering viewpoint. Until — soon — you can see and hear the new Wurlitzer Organ, this book will answer your most perplexing problems and enable you to plan intelligently and scientifically. Yours for the return of the coupon at the bottom.

Organ Division
The Rudolph Wurlitzer Co.
North Tonawanda, N. Y. Dept. AR-8

Your Name.....

Your Church.....

Your Address.....

(*Continued from page 142*)

"Floating" sash offers new convenience

ceiling without draft and is rainproof in this position. Upper and lower sash close in line, and the window is locked automatically when it is closed. Hayman Window Co., c/o W. W. MacGruder, Inc., Midland Savings Bldg., Denver 2.

CROSS BRIDGING

A metal cross bridging for wood joists, *Met-Cro*, is designed for easy installation: it opens like a scissor, is placed between the joists and nailed. It is said to be flexible enough so that beams off required centers can be just as securely fastened as those exactly placed. The exposed knife edge does away with accumulation of dust and dirt, it is claimed, and the spaces in the angle between the center rivet and the joists are ample for a 2-in. pipe to be passed through. It is fire resistant, made of rolled steel strip ¾ in. wide by 16 gauge, and finished for resistance to rust. Met-Cro Specialties Co., 87-34 78th St., Woodhaven, N. Y.

PLASTICS

Several new plastics developments have been announced recently by E. I. de Pont du Nemours and Co.:

Teflon, a new industrial plastic that withstands acids which dissolve gold and platinum and retains its strength and form at higher temperatures than any known organic material. Already in use in modern engineering developments such as the jet engine, and in radar and television.

BCM, a resin with excellent bonding properties and high resistance to heat. Structural panels made from it, reinforced with glass fabric or other materials, are undergoing tests for automobiles, airplanes, refrigerators and washing machines. The material also is being tested by plastics fabricators for

(*Continued on page 146*)

"Cast Iron, of Course!"

Real estate management executives who know say *cast iron* —whenever they are consulted on the best type of boiler for a new building or for replacement. For experience has taught them these important facts about cast-iron boilers:

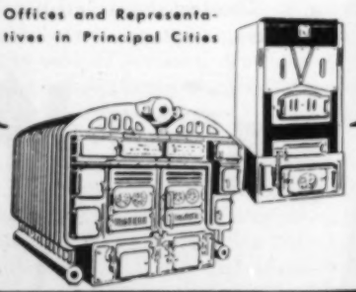
They last longer — their cost per year is lower . . . they successfully resist corrosion and rust . . . they are sectional — easily installed and replaced . . . they are easily cleaned and maintained at low cost.

Men who know also agree upon H. B. Smith Cast-Iron Boilers as the leaders in the field. For every commercial, industrial, institutional or residential use, for all fuels and fuel-burning methods, they recommend them without hesitation.

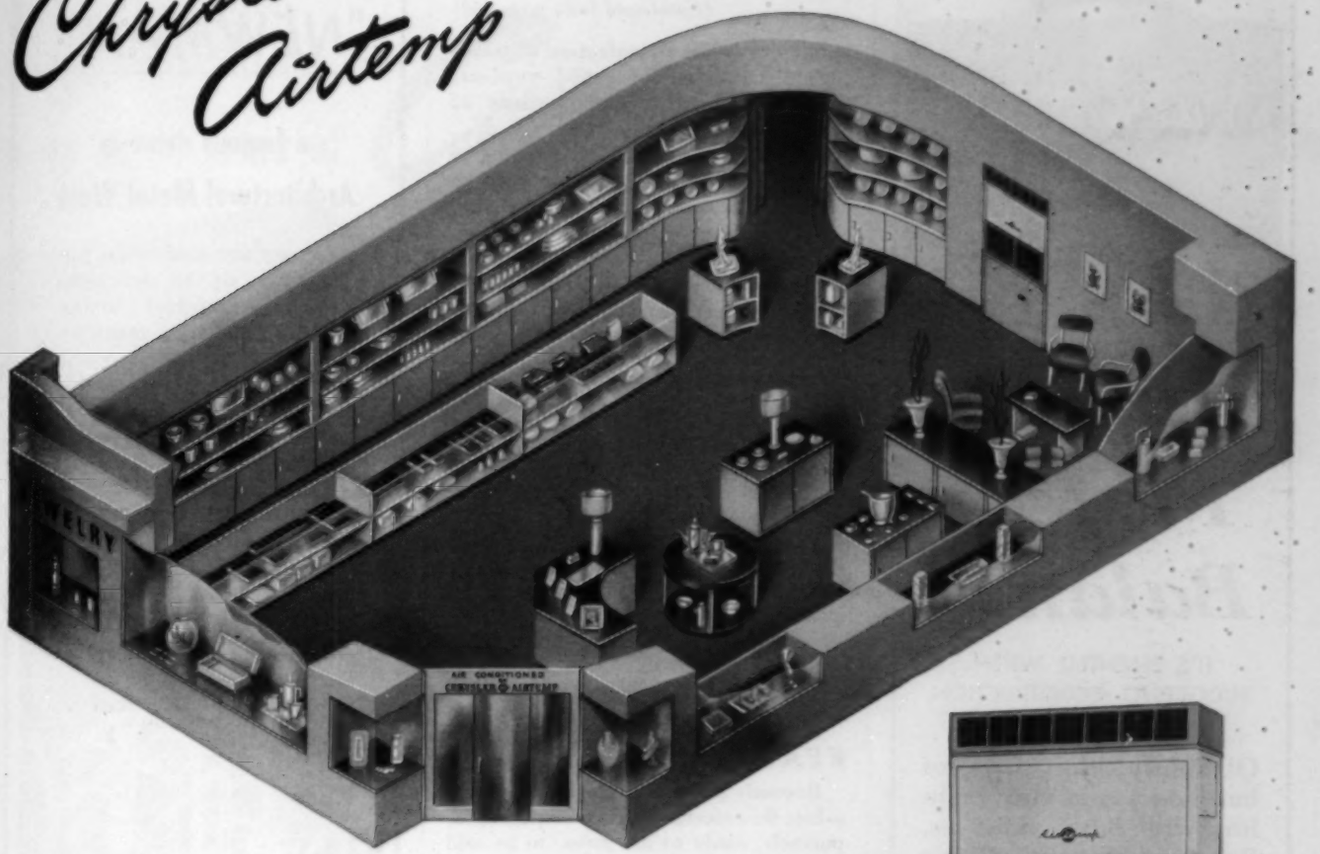
Write for a free catalogue of H. B. Smith *Cast-Iron* Boilers. And specify them with confidence, always.

H.B. Smith
CAST-IRON BOILERS
THE H. B. SMITH CO., INC.
WESTFIELD, MASSACHUSETTS

Offices and Representatives in Principal Cities



Chrysler Airtemp



Ever Try to Sell Jewelry?

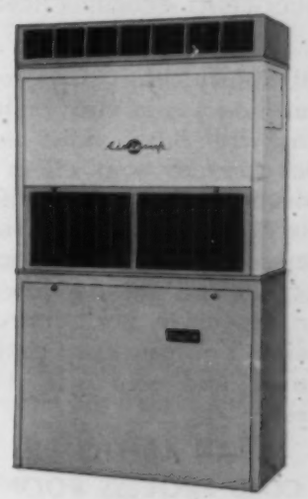
This might sound like an odd question to ask an architect, but architects indirectly can be an important sales force for jewelry stores.

People like to have lots of time for consideration when they buy jewelry. They don't like to be hurried, or bothered. And—they like above all to shop in comfort. That's why air conditioning has been such a sales booster for jewelers.

The ideal form of air conditioning for large or small jewelry stores is the "Packaged" Air Conditioner, pioneered by Chrysler Airtemp. It's simplified air conditioning, economical and easy to install in single or multiple units. And just as easy to move, too—a big advantage when remodeling or changing locations.

"Packaged" Air Conditioners occupy very little of a store's valuable floor space, and are so flexible in design that they fit into any store plan. All are equipped with the famous Chrysler Airtemp Sealed Radial Compressor, outstanding for long life at low operating and upkeep costs.

For specifications, architects are invited to write Airtemp Division of Chrysler Corporation, Dayton 1, Ohio; in Canada—Therm-O-Rite Products, Ltd., Toronto, Ont.



"Packaged" Air Conditioner

A simplified form of easy-to-install air conditioning that builds business for all stores. Heating coil can be added to "package" for Winter air conditioning.

CHRYSLER AIRTEMP

HEATING • COOLING • REFRIGERATION

Perfect Balance

IT'S ESSENTIAL WHEN BUDGETING CONSTRUCTION COSTS

Obviously, the costs of building a roof must be in line with other expenses. But it is to your client's advantage that you specify the best, assuring him of dependable, long-life protection and cutting down on expensive, periodic repairs. You can keep costs down and still get the best —

AN ABESTO COLD PROCESS ROOF

1. Remains elastic; surface will not crack or check
2. Always bonded tightly and smoothly
3. Highly resistant to oxidation

Write for our free specification sheets complete with material lists, diagrams, and clear instructions.

ABESTO MANUFACTURING CORP.

Dept. R-1 Michigan City, Indiana

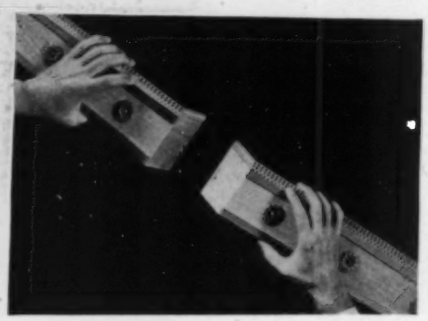
ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

(*Continued from page 144*)

suitability in the manufacture of transparent coatings for wood veneers, decorative panels, entire sections of sinks, etc.

CCA (cellular cellulose acetate), a foamed plastic lighter than cork. When bonded between two sheets of metal, wood, or plastic, it combines insulation against heat and cold with remarkable structural strength. Its use in wall panels, flooring, cabinets and exterior panels is being investigated.



Packaged, portable fluorescent strips

READY FLUORESCENT

Recently announced is a line of *Unite-a-Lite* fluorescent lighting in packaged, portable, ready to use form, to be sold and used like an appliance.

The units consist of base strips, in 24, 48 and 96 in. lengths, each with a plug connection at one end and a plug receptacle in the other. The unit can be mounted on the wall with common picture hooks to permit easy dismounting for moving to a new location, or it can be mounted to the ceiling with screws. Moe-Bridges Corp., Sheboygan, Wis.

NEW MATERIALS

A promising array of new building materials is being developed by private industry which is expected to result in the construction of more homes under the Veterans Emergency Housing Program than would otherwise be possible, according to Housing Expediter Wyatt.

A preliminary study of 68 products was made and 30 of them were found promising for use in the emergency program. They fell into two general classes: panels or entire dwelling units made from light-weight concrete, and structural panels made from plastics, aluminum and other substitutes for lumber and plywood.

The light-weight concrete products vary as to ingredients and fabrication. Many of them utilize waste materials such as slag, wood chips, waste paper, tree bark, and cotton hulls mixed with cement. They vary in size from standard size blocks that can be handled manually to precast house sections.

"NEWMAN"

a famous name in Architectural Metal Work

KNOWN far and wide because of the skill with which the architect's vision is fabricated into enduring metals. This co-operation and intelligent interpretation are made possible because experts with many years of experience are involved from preliminary sketches to the finished quality product.

64 YEARS OF VIGOROUS VITALITY AND STILL YOUTHFULLY KEEN

Striving to remain in the forefront has kept this organization youthful and vigorous . . . QUALITY PRODUCTS have kept pace . . . so that NEWMAN QUALITY IS EQUAL TO THE BEST.

Illustrated: a railing detail from the Louisiana State Capitol.

WRITE TODAY FOR ILLUSTRATED CATALOG

Tablets, directories, railings, storefronts, bank fixtures, doors, gates, windows and letters. Information and estimates without obligation.

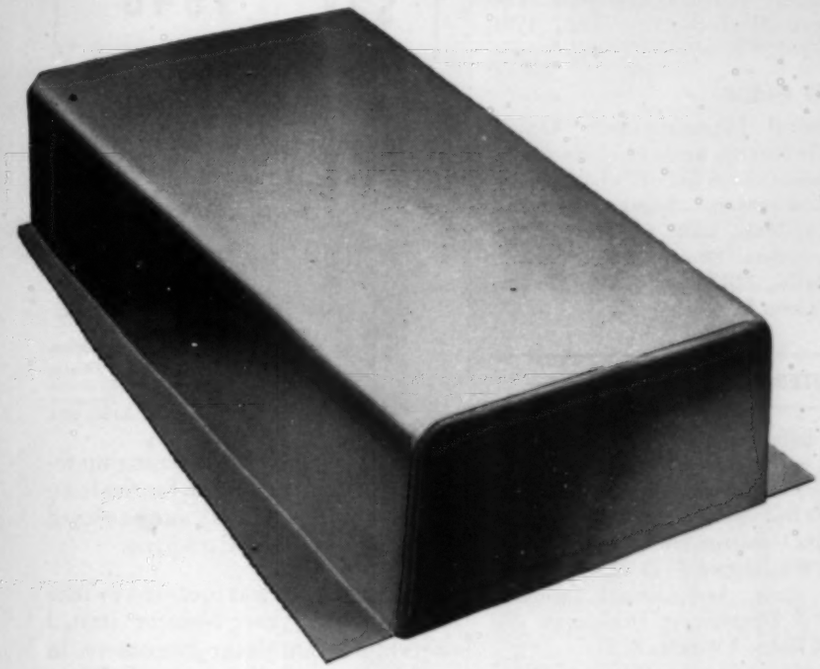
NEWMAN BROTHERS, Inc.

"64 Years Young"

708 W. 4TH ST., CINCINNATI 3, OHIO

FOR YOUR ALBUM:

A picture of 34 years of *Construction Know-how*



You are looking at a MEYER STEELFORM, which represents 34 years of experience in concrete joist construction. All this wealth of structural knowledge is available to architects, contractors and engineers from coast to coast. Next time call on Ceco.

Meyer Steelform construction is economical for store and office buildings, residences, apartments, hotels, schools, hospitals, garages and manufacturing buildings—in fact, all structures with lighter loads and longer spans.

A nation-wide independent survey indicates that architects, contractors and engineers prefer concrete joist construction two-to-one for the following reasons:

1. **Lower cost construction**
2. **Speeds up building**
3. **Provides rigid, strong, permanent, sound-proof buildings**
4. **Assures fire-resistive construction**

ASK YOUR CECO SERVICE HEADQUARTERS FOR COMPLETE TECHNICAL DATA, OR WRITE CECO'S GENERAL OFFICES.

It is universally recognized that concrete joist construction has definite natural advantages. It eliminates much of the concrete below the neutral axis which is both ineffective and largely wasted due to the weakness of concrete in tension. The amount of concrete used is held to the minimum necessary for any given span or live load. Naturally, this saving of dead load has its economical effect on all parts of the structure.

Meyer Steelform construction is the most economical of all methods of forming concrete joists because the joists and thin slab between them are formed with cores of *removable* steelforms supported on a skeleton centering. Once the concrete has set, the steelforms are removed and re-used many times, thus permitting a nominal rental charge for each use. Meyer Steelforms are handled on a rental basis only, leased to contractors and owners for specific jobs.

CECO STEEL PRODUCTS CORPORATION

GENERAL OFFICES: 5701 W. 25th Street, Chicago 50, Illinois

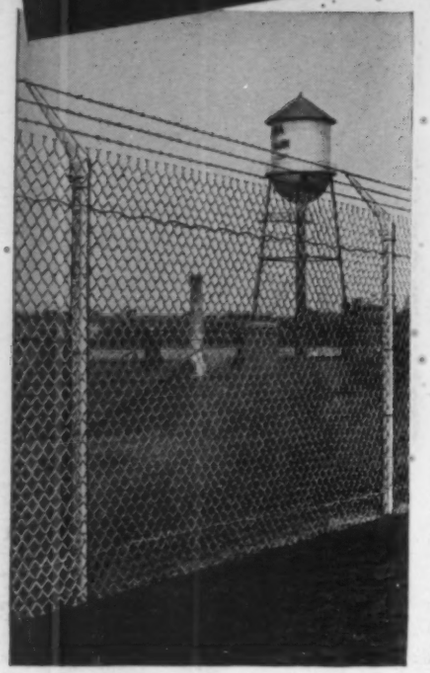
Offices, warehouses and fabricating plants in principal cities

PARTIAL LIST OF OTHER CECO CONSTRUCTION PRODUCTS

METAL WINDOWS AND DOORS • METAL FRAME SCREENS • METAL WEATHERSTRIPS • STEEL JOISTS • STEEL ROOF DECK
METAL LATH AND ACCESSORIES • REINFORCING STEEL • HIGHWAY PRODUCTS • CORRUGATED ROOFING AND ACCESSORIES

In construction products **CECO ENGINEERING** *makes the big difference*

4 BIG ADVANTAGES ---All Exclusive



4 Big Reasons for Specifying ANCHOR

Anchor Chain Link Fence has earned a top spot on the "spec" list of many architects because its rugged construction and exclusive design insure long life and maximum protection. Credit for this performance belongs to four big features . . . 1. *Deep-Driven Anchors*, which hold the fence permanently erect and in line, in any soil, in any weather, yet permit easy relocation where necessary . . . 2. *Square Frame Gates*, amazingly free from sagging and warping . . . 3. *U-Bar Line Posts*, rust-free and rigid . . . 4. *Square Terminal Posts*, which increase strength and durability.

Get This Book for A. I. A. File 14-K

"Anchor Protective Fences" is both a catalog and a specification manual. Shows many types and uses of Anchor Chain Link Fence . . . pictures installations for many prominent companies and institutions . . . contains structural diagrams and specification tables. Just ask for Book No. 110. You'll find it useful and informative. We'll be glad to send you a free copy. Address: Anchor Post Products, Inc., 6600 Eastern Ave., Baltimore 24, Maryland.

Anchor also makes a complete line of Anchor weld iron fences and gates. Send for Catalog 111 today.

Anchor Fence

(*Continued from page 125*)

and shower rooms are presented in detail in this booklet. Color range and hardware accessories illustrated. Specifications and construction details. Layouts of various stock sizes of partitions and doors in typical enclosure arrangements singly and in combination. The Sanymetal Products Co., Inc., 1701 Urbana Rd., Cleveland 12, Ohio.*

WIRING GUIDE

Electrical Modernization Guide for Your Home. Analysis of electricity in the home, check list of "what's wrong with your wiring," diagrams of house wiring systems, table summary of required outlets. 20 pp., illus. General Electric Co., 1285 Boston Ave., Bridgeport 2, Conn.*

LITERATURE REQUESTED

The following individuals and firms request manufacturers' literature:

Robert M. Becker, Structural Engineer, 50 Beacon St., Boston 8, Mass.

Cafritz Construction Co., 1404 K St., N. W., Washington 5, D. C.

Kay Earle, Architectural Designer, Survey & Engineering Draftsman, 208 Stobart Bldg., Victoria, B. C.

E. Carleton Granbery, Jr., and Diana Allyn Granbery, Architects, 34 Livingston St., New Haven, Conn.

H. H. Harriss, Chief, Architectural Dept., Home Builders' Research Institute, Inc., 426 Investment Bldg., Washington 5, D. C.

Fred J. Hughes, Architect, 1375 Euclid Ave., Cleveland, Ohio.

Clark R. Kjorlaug, Architect, 2502 Robinhood St., Houston 5, Texas.

Domingo Martinez, 307 W. 79th St., New York, N. Y.

Angus McSweeney, Architect, 514 Mission St., San Francisco 5, Calif.

Frederick Meisler, Architect, 125 Hudson St., Hackensack, N. J.

Mielke & Smith, Architects, 53 W. Jackson Blvd., Chicago, Ill.

John H. Moore, Architect, 504 S. State St., Marion, Ohio.

R. E. Robertson, Facilities Engineer, Consumers' Cooperative Services, Inc., 38 Park Row, New York 7, N. Y.

Roth & Rausch, Architects, 120 N. Broadway, St. Louis 2, Mo.

Sargent, Webster, Crenshaw & Folley, Architects, Watertown Natl. Bank Bldg., Watertown, N. Y.

Jos. P. Schierer, Architect, 404½ Marshall St., Room 201, Shreveport, La.

John E. Somerville, Architect, 230 E. Walnut St., Green Bay, Wis.

States Engineering Corp., 410 W. Berry St., Fort Wayne 2, Ind.

Cornerstone says "1924" Heating Results say "1946"

Home of Trenton Trust Co. Trenton, N. J. Mercer County's Oldest Trust Organization. Bank and 14-story office building erected 1924. Extension at left added 1939.

Twenty-two years of keeping up-to-date—that's the reason for the heating comfort and economy enjoyed by Trenton Trust Company.

Trenton Trust was founded in 1888—the same year Webster started serving steam-using customers. In 1924 when their present building was built it was provided with a Webster Heating System. Webster Sylphon Traps were installed on the 614 radiators and vacuum assured by a Nash Vacuum Pump.

In 1939 in order to give the entire building full advantage of newer developments, a 4-zone Webster Moderator System with balancing orifices and automatic control-by-the-weather was added.

Results in comfort and low cost have been outstanding. Repairs have been few, but promptly made when needed; maintenance has been regular; pressures have been kept low.

We solicit the opportunity to work with you in the same way we have been privileged to work with Trenton Trust.

WARREN WEBSTER & CO., Camden, N. J.
Representatives in principal U. S. Cities : : Est. 1888
In Canada: Darling Brothers, Limited, Montreal

Webster
HEATING SYSTEMS

TOILET ROOM ENVIRONMENTS *of Tomorrow* ARE AVAILABLE TODAY WITH *Sanymetal*

"PORCENA" (Porcelain on Steel) TOILET COMPARTMENTS

Sanymetal Normandie Type Toilet Compartments impart a moderately streamlined effect to a toilet room environment. Streamlined design wedded to utility fulfills all requirements. Unadorned utility no longer satisfies a public accustomed to bathrooms embodying varying degrees of modernity and elegance. Available in three finishes: (1) "Porcena" (porcelain on steel); (2) "Tenac" (baked-on paint enamel finish over galvanized, bonderized steel); (3) baked-on paint enamel finish over regular furniture finish, cold rolled steel. "Porcena" (porcelain on steel) is available in a variety of standard colors.

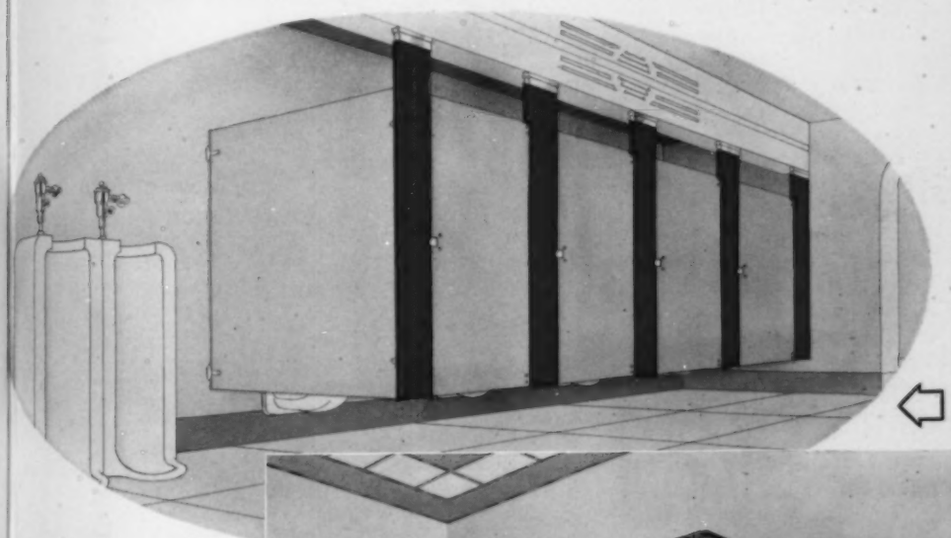
A toilet room environment impresses more persons, either favorably or adversely, than any other single feature of a building. The toilet room is the one room that's important to all occupants of the building. Toilet compartments usually dominate a toilet room and influence the toilet room environment.

Sanymetal "PORCENA" Toilet Compartments, available in several different styles and a wide range of never-fade colors, provide the means of creating the most suitable toilet room environment for every type of building.

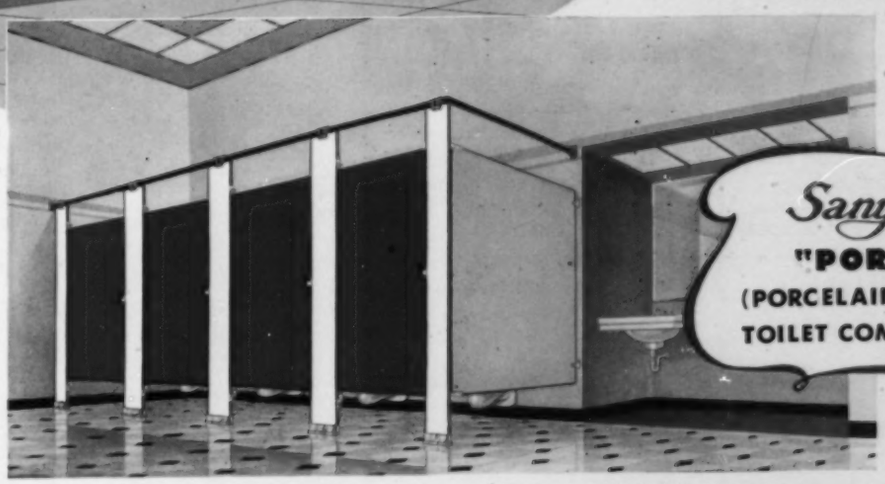
Made of the ageless, fadeless material, Porcelain on Steel, Sanymetal "PORCENA" Toilet Compartments set heretofore unapproached standards of sanitation, orderliness and appropriate elegance and convenience in toilet rooms. Their modern design and construction makes them as suitable for buildings of tomorrow as for those of today.

Sanymetal "PORCENA" Toilet Compartments embody the results of over 32 years of specialized skill and experience in making over 70,000 toilet compartment installations. Ask the Sanymetal Representative in your vicinity (see "Partitions" in phone book) for helpful suggestions on planning modern toilet room environments. Refer to Sanymetal Catalog 19-B5 in Sweet's Architectural File for 1946 or write for file copy of Catalog 84.

THE SANYMETAL PRODUCTS COMPANY, INC.
1689 Urbana Road · Cleveland 12, Ohio



Sanymetal Century Type Ceiling Hung Toilet Compartments are particularly appropriate for schools, institutions, public buildings, office buildings, hotels, clubs, industrial plants, and theatres. They impart dignity, refinement, and cheerfulness to the toilet room environment. They make up into a rigidly fixed installation. Available in three finishes: (1) "Porcena" (porcelain on steel); (2) "Tenac" (baked-on paint enamel finish over galvanized, bonderized steel); (3) baked-on paint enamel finish over regular furniture finish, cold rolled steel.



Sanymetal Academy Type Toilet Compartments provide a certain distinctiveness. This type of partition is the only one in which all the dignity and distinctiveness of standard flush type construction, unmarred by posts, is appropriately combined with headrail. These toilet compartments are available in three finishes: (1) "Porcena" (porcelain on steel)"; (2) "Tenac" (baked-on paint enamel finish over galvanized, bonderized steel); (3) baked-on paint enamel finish over regular furniture finish, cold rolled steel.

*Sanymetal**
"PORCENA"
(PORCELAIN ON STEEL)
TOILET COMPARTMENTS

Sanymetal Catalog 84 illustrates several typical toilet room environments.

*Sanymetal**

**Trade Mark Reg. U. S. Pat. Off.*

TOILET COMPARTMENTS, SHOWER STALLS AND DRESSING ROOMS